

FLIGHT

The
AIRCRAFT ENGINEER
AND AIRSHIPS

FIRST AERONAUTICAL
WEEKLY IN THE
World

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DEVOTED TO THE INTERESTS,
PRACTICE AND PROGRESS
OF AVIATION

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Municipal Aerodromes

THE Aerodrome Advisory Board shows signs of having stirred itself into active life. It has announced the establishment of a Site Selection Committee, which will advise local authorities and others on the selection of aerodrome sites. It also announces that it has "formulated and submitted to the Air Ministry proposals for the preparation of a survey and scheme of development for the future air routes and aerodromes of Great Britain." The composition of the Aerodromes Advisory Board is imposing, and a list of its members was published in the issue of *Flight* dated March 8, 1934. Of the twenty-six members of the Board only six represent such active aeronautical interests as the Air Ministry and the Royal Aeronautical Society. That being so, this activity after no more than twelve months of existence is perhaps a matter for congratulation.

Many local authorities have been in a state of natural bewilderment, first, as to whether they ought to spend the ratepayers' money on buying a site for an aerodrome, and also on the subsequent questions of selecting the precise site and of developing it. What such local bodies have needed above all things has been some impartial authority which was in a position to say, and would have the courage to say, to certain towns "Don't." No authority can be in such a position until a scheme of probable developments of air routes has been drawn up which will give a fair indication of what cities and towns are likely to lie upon the future air routes, and which are so unlikely to attract much air traffic that they would be wiser to save their money. We are therefore glad to see, according to a statement issued over the signature of the Secretary of the Board, that the Board has formulated *proposals* for the preparation of a survey and scheme of development. After a year or so it is certainly a great achievement to have reached the stage, not, indeed, of drawing up a scheme of development but of formulating proposals for the

preparation of a survey and scheme. In due course, no doubt, the proposals may become more concrete, the survey may be prepared, and ultimately the scheme of development may actually materialise. Then we shall have reached the point at which an actual beginning may be made in advising the local bodies whether to buy or not to buy. We cannot, of course, prophesy what time will have elapsed before the Board will have reached the stage of being in a position to make an actual beginning of giving practical advice. We shall assume that this stage will be reached "in due course."

Site Selection

SUBSEQUENT steps are divided by the Board into site selection and site development. In selection the first necessity is the advice of really competent and practical aeronautical authorities. For this reason we rejoice that such interests are represented on the Board by the impressive proportion of six out of twenty-six members. The next desideratum is the inclusion of the aerodrome site in a sound town-planning scheme, and the town-planning interest is represented on the Board, not very strongly in numbers, but certainly strongly in merit. Of course, sites have been selected by various municipalities in the past few years, and the Air Ministry has an organisation which has been at the disposal of local bodies to help them in making their selections, while very good work of the same sort has been done by the Automobile Association since 1928. We understand that the A.A. will continue to carry on the same good work in collaboration with the new Site Selection Committee of the Aerodromes Advisory Board. That is a considerable guarantee that the work will be well done.

The development of selected sites would appear to be on the whole a more straightforward job. In the majority of cases all that will at first be necessary is acquiring a good landing ground, providing communications with the town, installing a

telephone and petrol pump, and building a shelter. Then, as airways develop, the amount of traffic will determine the amount of development needed by each of these aerodromes. Expert assistance will naturally be desirable as to the nature of the development in each case, but that will not be nearly such a knotty problem as the earlier ones of deciding whether to buy, when to buy, and what to buy.

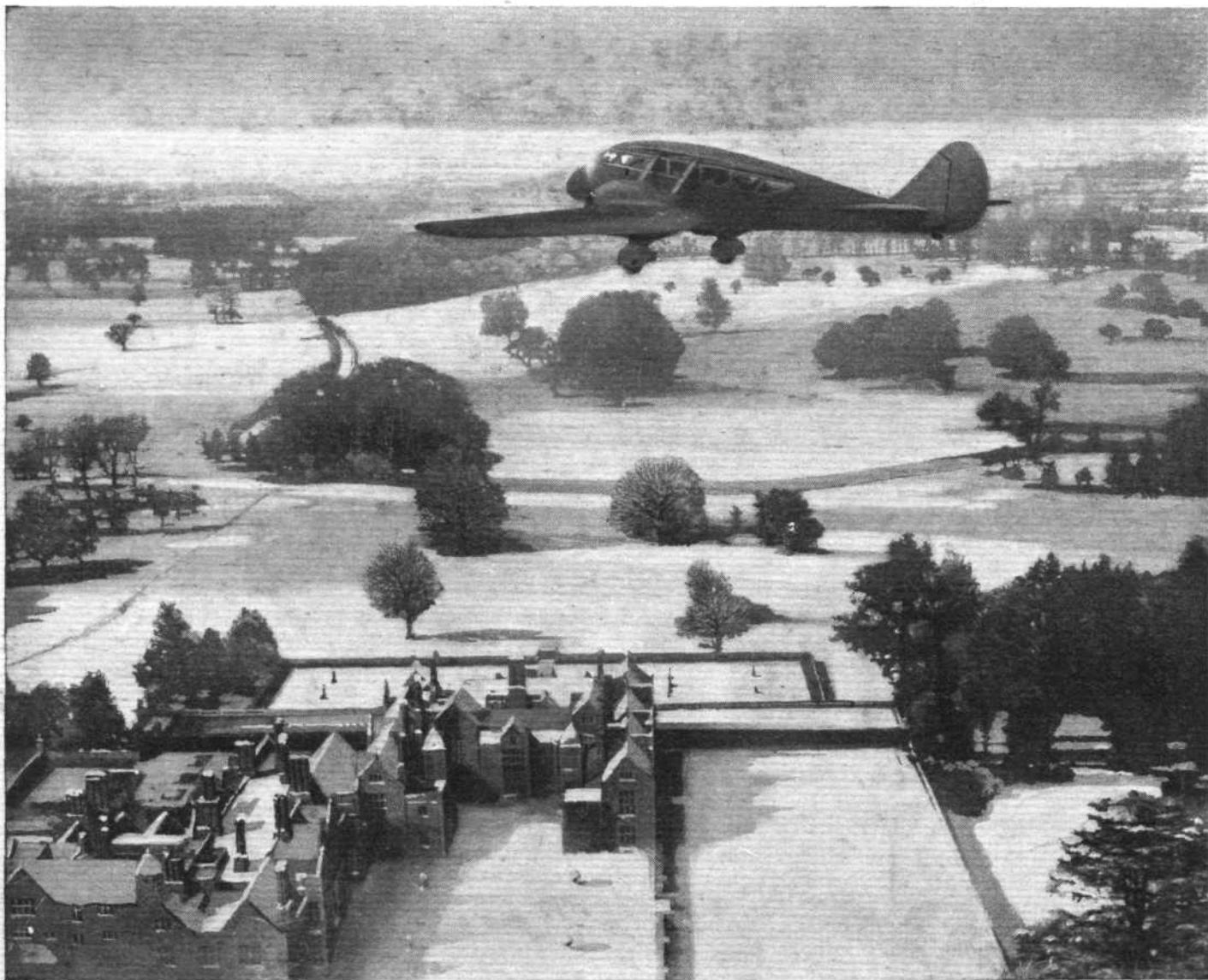
The present indications are that there will be most traffic on these inland airways which will provide links with overseas air services. Other internal lines may respond to initiative by the Post Office. The Postmaster-General may offer patronage to certain routes, even though they be not in existence, which promises a material expedition of mail deliveries. The degrees of development required will vary very greatly, but there ought not to be anything speculative about the matter. What everybody wants to avoid is starting air services which have small chance of paying their way. When business letters posted in the evening can reach their destinations next morning by existing means of transport, it would be waste of effort and of money to start

an air line in competition which, even by night flying, could not deliver the letter any earlier than the train could do.

A Good Year

ACH year the Royal Air Force increases the number of hours flown, and each year the number of serious accidents per thousand hours flown is decreased.

The actual number of casualties, fatal and otherwise, varies from year to year, and if one were to judge solely by the figures of fatalities, some years would seem much worse than others for no very obvious reason. In proportion to hours flown, however, the improvement is continuous. In the year 1934, up to the date of writing, the R.A.F. has flown some 375,000 hours for the loss of thirty-one lives—one death to about 12,100 hours. Considering that Service flying is not on the same footing as commercial flying, no one could call that a bad record, or assert that the risks involved are great enough to deter parents from allowing their sons to go to Cranwell or Halton.



The Editor and Staff of "Flight" reciprocate the many greetings received by air, land and sea, and wish their readers at home and abroad a Happy Christmas and a Prosperous New Year.

The Outlook

A Running Commentary on Air Topics

Air Mails at Surface Rates

LAST week a well-known daily paper stated that the Post Office intended to send all Empire Mails, except those to Canada, by air at a flat rate of 1½d. Enquiries at the Air Mail Department of the Post Office produced no confirmation of the fact.

It is quite obvious, of course, that, just as all first-class matter is now sent by the fastest forms of surface transport—even at a loss, if necessary—so, eventually, all mail must be sent by a still faster form of transport for the simple benefit of the general community.

Equally obvious is the fact that we have at present no air fleet large enough to carry a total weekly mail tonnage running well into two figures to Australia or to any other part of the Empire. In the meantime, the mail carried by Mr. Edward Hillman on the internal service is only a fraction of the total amount sent. If he found it necessary to use a special machine or machines the Post Office would need to provide a subsidy in one form or another. A loss on fast mail-carrying is permissible when the business obtained thereby eventually increases the State revenue. It is, finally, a matter of profit and loss rather than of a mere desire for go-ahead mail transport.

Helicopters in England

CONSIDERABLE interest attaches to the announcement elsewhere that a very promising type of helicopter is to be built in England. The fact that Mr. Robert Blackburn has interested himself in the invention is a guarantee that the Asboth helicopter principle is sound in its broad principles, whatever minor technical problems may still be awaiting solution. The fourth experimental machine of the series consisted essentially of two engine-driven lifting screws, co-axially placed and running in opposite directions. Control was obtained by vertical flaps in the downwash of the lifting airscrews.

One may assume that, the question of control having been solved in a general way, there is cause to hope for fairly rapid development. Almost from the earliest days of flying it has been known that direct lift can be obtained. Controllability has been the main stumbling block. Another difficulty has been that of gliding flight with the engine out of action. We gather that Mr. Asboth has devised means for ensuring the autorotation of the blades. What these means are has not been disclosed, but it seems likely that some method of changing the pitch angle of the airscrews is the object aimed at, as this would appear to be the obvious way of ensuring the continued rotation of the blades in the same direction as when driven.

Further developments will be watched with the keenest interest.

"B" Licence Blind Flying

AT first thought the new blind-flying regulation for "B" licence candidates may appear to be a very excellent idea, but mature consideration will bring several difficulties to light.

The most obvious one can be dismissed as inevitable. Will a simple compass-flying test under the hood indicate the capacity of the pilot to carry out real blind-flying under difficult and perhaps dangerous conditions? A great many "A" licence pilots who have done a few hours under

the hood are quite capable of flying a compass course, and even of altering such a course, making due allowance for compass peculiarities, but hardly one of them could be trusted to do a job of work under transport conditions.

A blind-flying course is, however, largely a psychological one; the pilot must be forced to believe his instruments, to disbelieve his sensory impressions, and to resist the temptation to go down to "look for the ground" before the time is ripe.

A more serious problem can be summarised in the imaginary case of a "B" pilot, temporarily out of a job, who finds that his renewal is due, and that he cannot afford to take the necessarily rather expensive course. Operators would, one imagines, for their own peace of mind send their staff for a course where necessary.

Cockpit Comfort

ALTHOUGH the cabin machine makes it so conveniently possible for the private owner to fly about this country and the Continent in his ordinary clothes, there will always be a demand for the open type of aeroplane among people who fly primarily for sport. Somebody, therefore, might devise a cockpit which is, at the same time, both draughtproof and easy to enter.

During recent years the best examples have undoubtedly been those with side-by-side accommodation and with large three-piece glass screens. In tandem types the cockpits range from those in which entry, with even parachute equipment, is simple, but in which, at cruising speed, one sits in a small whirlwind, and those in which entry is a matter for the contortionist but for which neither goggles nor heavy clothing are necessary.

Why does not the designer provide a hinged false top with a three-piece screen fitting as snugly around the face as it does on some racing types? The "lid" could be arranged with a quickly operated emergency catch, and the "entrance" could be as large as the cockpit itself.

Bombing Naval Ships

ANAVAL correspondent recently wrote an article in which he assured us that all the battleships of the Royal Navy which have been fitted with extra deck armour—as most of them have been—are virtually impervious to air bombing. The deck armour, he asserted, can only be pierced by the 2,000 lb. bomb, and such a bomb cannot be carried by a ship-plane off a carrier. Shore-based aircraft cannot carry more than one such bomb, and so have no "second barrel." Moreover, during the recent Navy-Air Force exercises, shore-based aircraft did not show themselves adept at ship recognition. Dive bombing, he admitted, increases the accuracy of the bombers, but makes it less easy for the aircraft to escape. Moreover, he says that a bomb dropped from a diving aircraft does not reach its limiting speed before impact, while, if dropped from a few hundred feet, it does not strike its objective exactly nose-on at right angles.

If the above statements are accurate, it is all to the good of Britain. If we had to choose between extreme alternatives, on the one hand that the British fleet and the enemy fleet should both be sunk by air attack, and on the other hand that both fleets should be undamaged by air bombs, we should much prefer that both fleets should survive.

EXPOSED!

The Chief Photographer of "Flight" Recalls Some Experiences, Amusing and Otherwise, During Twenty-one Years of Pictorial Reporting



"Once, when I wanted a head-on picture . . . George Bulman said, 'That's all right; we'll try it.' Try it we did . . ."

"I WANT a good mosaic of Wytschaete village. Mr. ——will take you up." This sounds like Belgium, but the scene is laid at the Artillery Observation School, Almaza, Egypt. It was here we had the famous village laid out in stones on the desert for pupils to observe gunfire.

The machine on this occasion was an R.E.8, and it was my first flight in this type. Many were the frightening things we had heard about them. . . . They broke in the air, they wouldn't come out of a spin, they caught fire; in fact, they had a reputation for doing anything but fly. Actually, handled properly, they were quite good aircraft for their time.

We duly took off and proceeded towards our objective. The weather was bumpy and the overhang on our top wings seemed to me to be flapping a good deal. I passed a note to the pilot to this effect, only to receive the answer: "It's all right—if they weren't flexible they'd break."

Considerably comforted, I proceeded to take the necessary strips of photographs, signalled "finished" to the pilot, and we turned for home.

No, the wings did not break on the way back, but the pilot just pushed that "Harry Tate" straight into the ground, apparently without making any sort of attempt to land. He was in front, and got a smashed jaw; I scraped my arms, and the taxpayer had to pay for a new machine; which was just too bad.

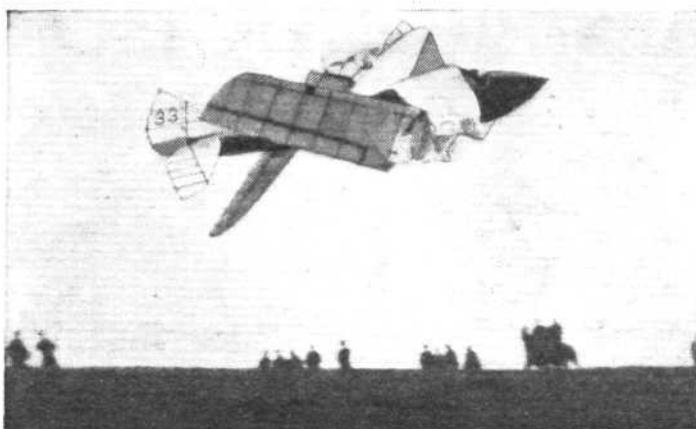
Looking back, that was one outstanding memory in twenty-one years of camera-wielding. Others bring one nearer home. For instance, Firle Beacon and Itford Hill provided some grand sport during the glider contests of 1922. Maneyrol, on the last afternoon of the six-day meeting, brought his Peyret monoplane to the top of the hill to start. This glider was an extraordinary affair, with a tailplane of the same span as the main plane. When, at last, the "buny" was stretched and the Frenchman was ready for certain death (as many thought) almost everybody (except the Press photographers, they being somewhat hard-boiled) turned their heads away. *Maneyrol won that competition—and a £1,000 prize—by a matter of an hour and a half, remaining in the air 3 h. 21 m. 7s!*

De Havillands had a glider for this meeting. It had an aspect ratio of 10 to 1 and a pronounced droop. When in flight any movement of the ailerons merely caused the wings to warp, so, brain-wave of brain-waves, they altered the controls to operate on the old-fashioned wing-warping system. Hearn, the pilot, was duly shot off from one of the lower slopes to try it out. The result, dear readers, is depicted opposite. The wings became self-warping, and I held that camera to my eye, waiting, waiting, while the wings twisted first one way and then the other, further each time, until at last they gave up the ghost. The stub ends kept the craft straight, and it sank with an imperial plonk into the ground. Hearn stepped out of the *débris*, and, with a quite expressionless face, remarked: "I think we had better go back to ailerons."

Incidentally, a man standing by my elbow remarked on what he called my "wonderful coolness" in not pressing the button before. I murmured something about "just experience, you know." As a matter of fact I had been too stupefied with fright to press it before!

At six-thirty one summer morning in 1921 I joined the R.36, which was to control the Ascot traffic. The mooring mast at Pulham had a narrow iron ladder up its centre and one had to clamber up some 120 feet of this to reach the improvised gangway from the top to the ship. It would not have been too bad had I not been treated, when half-way up, to a large bundle of signal forms dropped on my head from some fifty feet above. But that is by the way; what I do want to say is: "While it sticks together, give me an airship for travel." No noise, no dust, no fumes; just the embodiment of what one feels flying should be—a glorious sensation of floating peacefully over the earth.

Part of the proceedings was the despatch of messages by parachute over Croydon aerodrome. The parachute was a "Guardian Angel" of the type in which the canopy was folded up in a container, which remained attached to the aircraft while the falling weight pulled the 'chute out. Up to that time I had thought parachutes were rather nice things if one's toes were frizzling, but, after hearing that one coming out of its bag, sounding like all the fabric which has ever been made being torn by all



"The wings became self-warping, and I held the camera to my eye, waiting, waiting . . . until at last they gave up the ghost."

the girls who ever covered a wing, I made a mental note that parachuting would never be my *forte*.

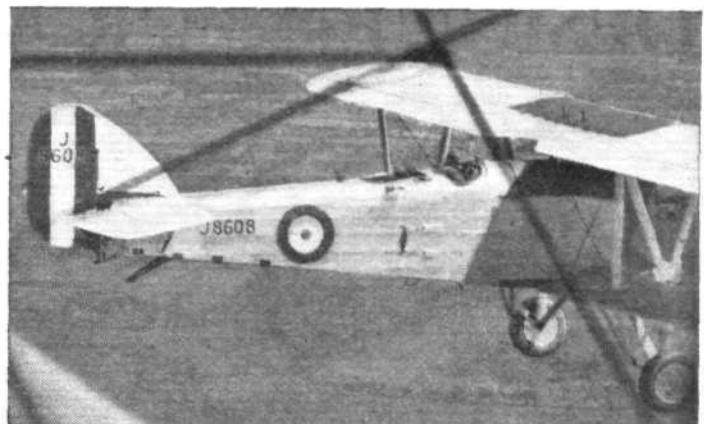
Flying with R.A.F. Squadrons in formation above the clouds is a grand idea for a morning's work, but it occasionally has snags. Once, having flown for some forty minutes round about glorious cumulus clouds, some of which were six or seven thousand feet from base to tip, I told the pilot I was finished, and settled down, well pleased with the pictures in the bag. He pointed out that we were at 9,500ft., and did I mind a few stalled turns to lose height more rapidly? I shut up the bag, made myself comfortable, and told him to go ahead.

The stalled turn did not happen quite in accordance with the book of rules, for the next thing I knew was that we were on our back with, apparently, every intention of staying there. I was not strapped in. The camera bag had to be trapped with one foot and the camera clutched tightly in one hand, the other holding on to the seat for dear life. Meanwhile, all the dirt from the floor was going up—or down—my nose and in my mouth. A parachute—observer's type—was hung on the side of the cockpit, but while I was deciding how to get hold of it and fasten it on, we returned to the normal way up. The rest of the journey was a straight and gentle glide. This episode is *not* illustrated.

It is not often, I imagine, that one photographer has recorded both the start and the finish of a long-distance flight. The occasion was in 1927, when Carr and Mackworth attempted to break the world's distance record in a Hawker "Horsley." The place of departure was Cranwell Aerodrome. I got my picture of the take-off, then ran back some thousand yards to where another "Horsley" was waiting for me. Completely exhausted from the run I staggered into the machine, and off we went.

By cutting off a corner we were soon alongside the other "Horsley," and the thrills began. Bumps in an ordinary aeroplane are—well, bumps, but when you see a machine loaded to the limit go down and down, bumps take on a different aspect. Moreover, petrol was overflowing from every vent on the long-distance "Horsley," and we had to go into uncomfortably close formation, while frantic signals to turn this on and turn that off passed between us.

Now, all was well and we sailed along. I thought: "Just one picture over the coastline"—sort of white cliffs of old England business—"and then for home." But no. A tiny wisp of blue appeared by the tail of the other machine and then grew longer and longer until it stretched



"When you see a machine loaded to the limit . . . bumps take on a different aspect . . . we had to go into uncomfortably close formation."

for hundreds of feet behind. It was oil, and the whole machine began to glisten where it sprayed.

From where we were one could see hasty conferences between the pilot and navigator as to whether they should jump with their chutes and leave a machine with a thousand gallons of petrol on board to crash where it might, or take a chance of landing with the attendant risk of it going up in flames.

Martlesham Heath—one of the worst-surfaced aerodromes in the country—in sight, and we ourselves went down and landed. A quick tumble out, and the camera was set as the other "Horsley" glided in. Perfect judgment, a little burst of engine to take off the rate of sink, and the heavily overloaded machine trundled gently to a standstill without even bursting a tyre—and it had burst one while just standing stationary on the tarmac at Cranwell! A very gallant show.

There is only one view of an aircraft which looks really clean, and that is a head-on view taken while the machine is flying. Once, when I wanted such a picture, the redoubtable and ever-helpful George Bulman said, "That's all right; we'll try it." We did, and very successful it was, as you can see from the heading picture on the previous page.

In fact, it was so successful (if I may say so) that these views became rather in demand. The next machine I photographed was flown by a pilot with an "A" licence and about fifty hours' experience. He fancied the head-on idea. I, not having the courage to tell him I thought it a rotten one, stood to be shot at. One hundred feet was the nearest he came to the ground—which was most disappointing. . . . Thank heaven!

Somebody else hit the ground and bounced over my head, and another pilot wiped one of my ears with a wheel and the other with the tail skid, and yet another nearly parted by hair with his rudder. No names, no pack drill!

One well-known pilot, when asked to fly for this view, remarked: "Have you ever seen a man who has been hit by an undercarriage? I have." Then he murmured something about "sacks of potatoes," and we fell in with his ideas.

Of course, of all the experiences in life none can compare with that of going solo for the first time. Never shall I forget my first solo on a Camel. No rudder, no Sutton harness, no throttle. The tail gets off well before the nose, and straight "flying" feels like the crazy variety; in fact, ten minutes of it, and one wonders if there is a whole bone left in the body. A photograph of the type in question appears on this page.



". . . my first solo."

J. Y.

DESIGNED FOR MASS PRODUCTION



A three-quarter front view of the "MB1" in skeleton. Note the sharp "vee" of the windscreens. (Flight Photo.)

WHAT may be called the "Meccano" system of construction has long been held up by practical engineers as the ideal one for an aeroplane which it is intended should be built in large quantities. Unfortunately, design features which satisfy the production engineer are all too often opposed to the ideals of the aeroplane designer. Notwithstanding this, the majority of aeroplanes to-day are naturally, for economical reasons if for no others, built so that they can be so produced more or less to a pattern, that is, they are jig-built to ensure interchangeability of the main structures. This, however, is as far as the majority of modern aeroplanes go, for their structures are either welded ones or follow some form of built-up construction making the whole into a unit, which, more often than not, has to be returned to the manufacturer in the event of damage. There are, of course many manufacturers who design so that small pieces can be replaced or changed by unskilled labour.

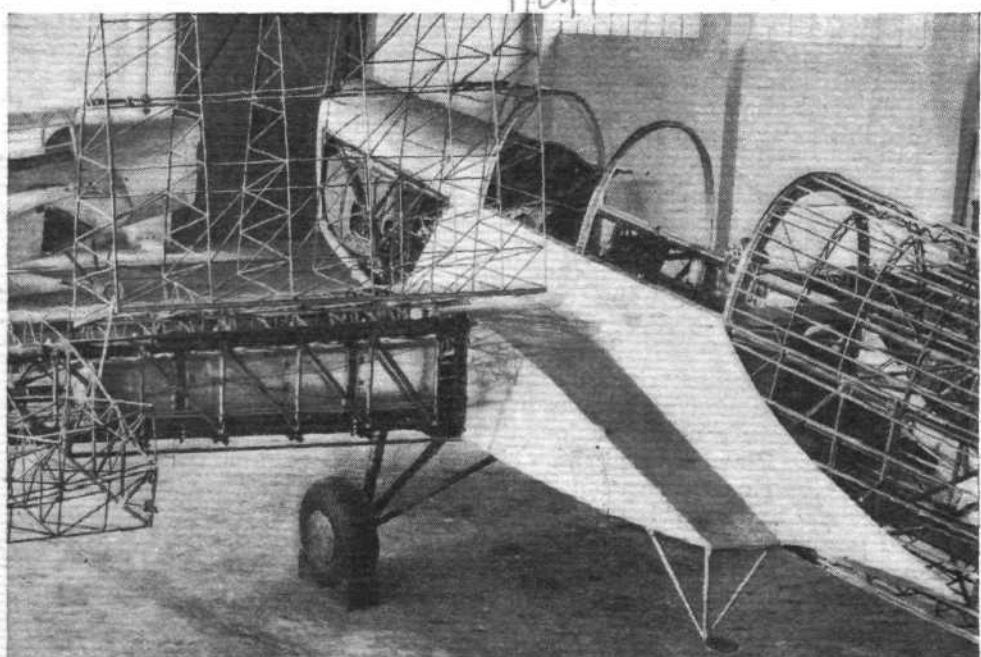
Carrying this idea to its (almost) logical conclusion, Mr. James Martin, of the Martin-Baker Aircraft Company, has produced a low-wing two-seater-in-line cabin aeroplane to cater for the luxury two-seater market, and at the same time to demonstrate the feasibility of his ideas on mass production. Generally speaking, the "MB1," as it is called, is built up of a large number of small pieces of steel tube bolted together; any of which may be replaced with a minimum of trouble and very little skilled supervision.

The fuselage has longerons of T.5 steel tubing. In the after portion, the strut bracing between the longerons is bolted to the latter by an interesting patented form of joint which is also used for the wing spars. This joint consists of a short liner pushed

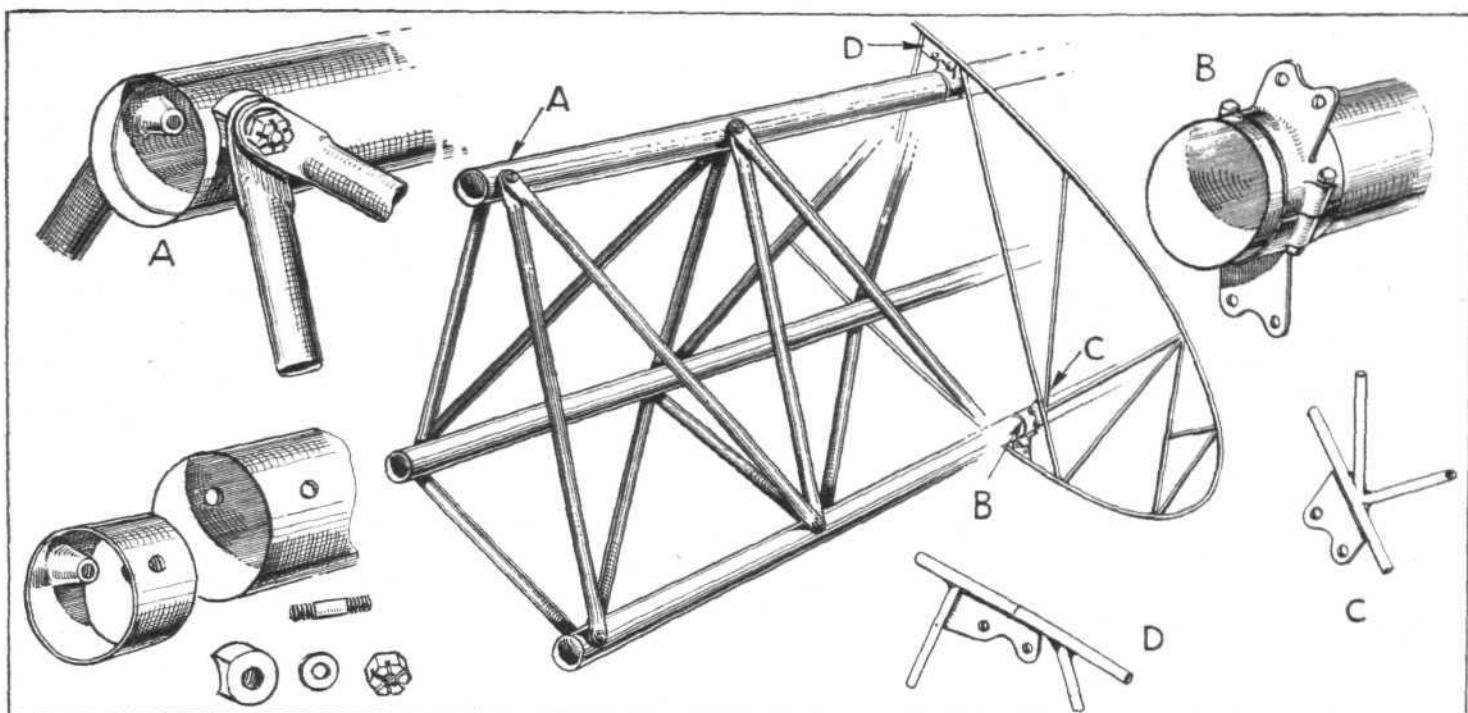
*The Martin-Baker
"MB1," a New and
Well-equipped Cabin
Monoplane Designed
Throughout to Allow
Easy Production and
Assembly*

inside the spar so that a hole through the spar wall coincides with a tapped hole in the liner, the nut for which is brazed to its inner surface. A stud is then screwed through the longeron into the liner and a saddle washer dropped over the stud to bear on the outer surface of the longeron, leaving the outer screwed end of the stud sufficiently long for the flattened end of a strut or struts to be dropped over it and bolted on. The nuts are usually of the castle type locked with a wire through the slots. The centre and front portions of the fuselage do not use this form of joint, but the sections of the longerons finish with fork-ends which, like the struts, are bolted to machined fittings.

The wing spar is particularly interesting, as Mr. Martin



A closer view of the "MB1" taken from behind, with the flap raised ready for folding the wing. (Flight Photo.)

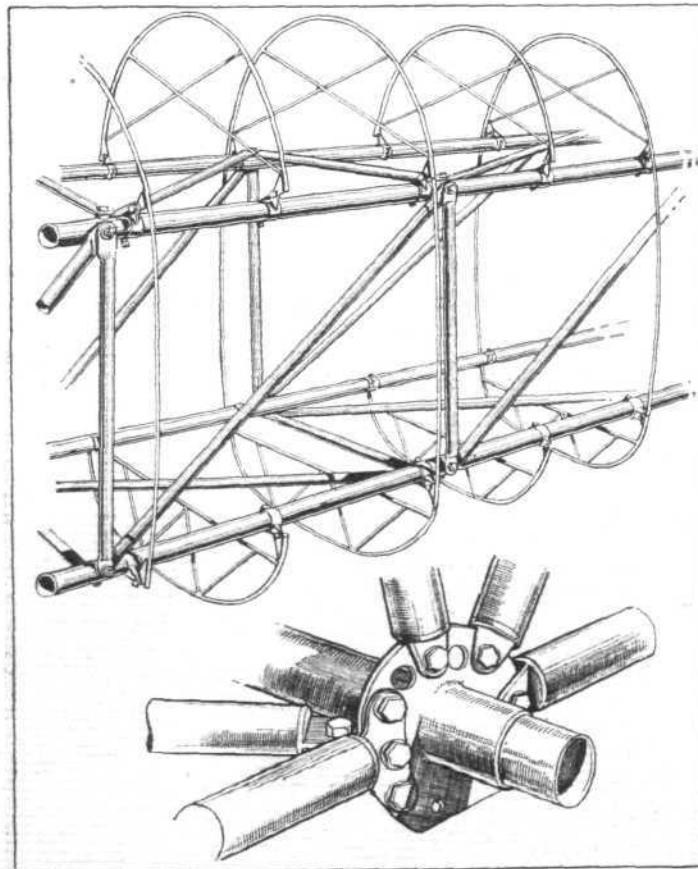


A set of sketches showing the chief points of interest in the wing spar. The details on the left are of the main strut attachment and on the right of the method by which the ribs are secured. The letters are a key to the details.

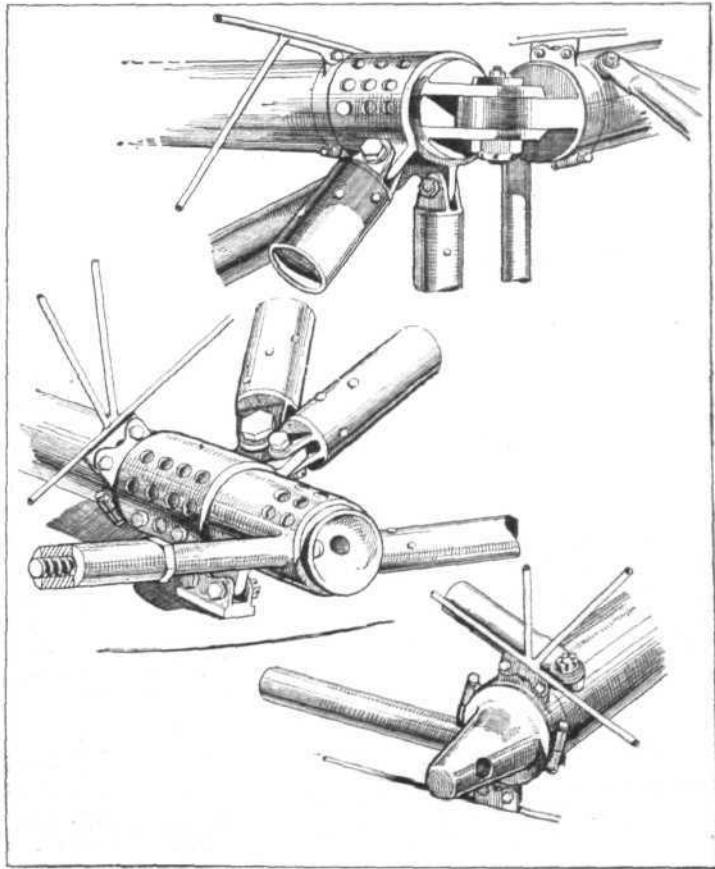
has used three booms, all of thin-gauge but comparatively large-diameter tube. Two booms form the after surface of the spar and are more or less vertically mounted above each other. The third boom forms what may be termed the leading edge of the spar, being in front of the other two and on a level with the lower one. The wing is arranged to fold about the joints of the after pair of booms.

These booms taper towards each other as the wing tip is reached, and are braced by a system of smaller tubes with flattened ends bolted to them in the same way as the struts and longerons in the fuselage are bolted to each other. The wide base of this pyramidal spar and the large diameter of the three booms certainly appears to make it very strong in torsion.

The wing ribs are aerofoil sections of very small-diameter



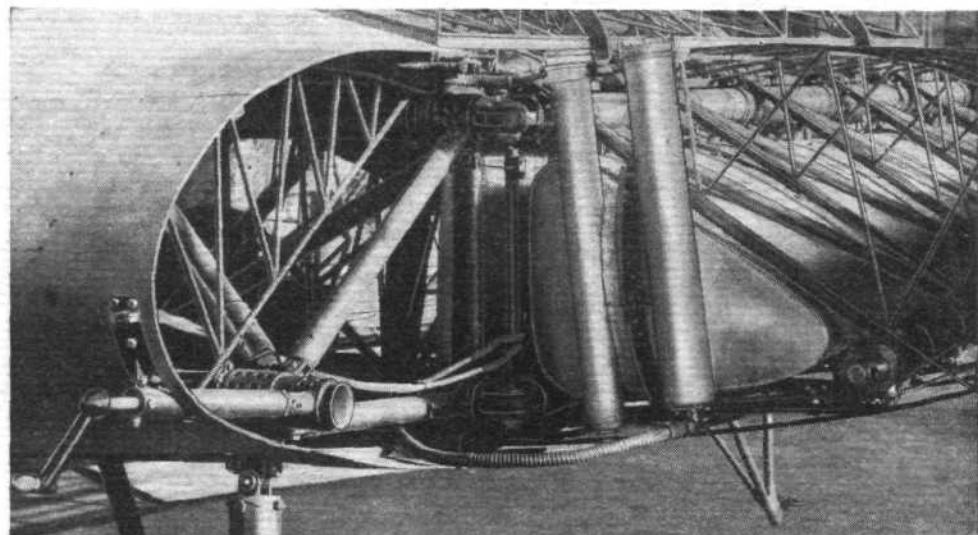
A section of the rear part of the fuselage, at which point the struts are secured in the same way as on the wing spar. At the bottom is one of the machined-fitting joints used in the front part of the fuselage.



(Top) The upper of the two joints about which the wing folds; (below) the two halves of the locking arrangement on the front joint of the wing spar. The screwed pin is worked by a small handle.

T.5 tube, mostly braced in Warren girder fashion with small tubes brazed into position with a bronze preparation. This form of brazing is used in a large number of places in the machine, not only for the wing ribs but also for the tail units, fairings, and so on. After a series of tests Mr. Martin is convinced that, from the strength point of view, the results are even better than those of welding, and, as the temperatures used are so low, the brazing causes no distortion.

The "M.B.1" bristles with neat features of the sort which private owners so often wish were included in their machines. For example, the hinge pins on the rear face of the spar are so arranged that there is no tendency for the wing to fall backwards as soon as the front pin is released. Folding is, therefore, a one-man job. The front pin is on a screw, and can be withdrawn or inserted by the rotation of a small handle on the leading edge, and the wing can, after two flaps have been raised at the back, be pushed back without fear that it will bump into the fuselage, because there is a stop to prevent it doing so.



How the wing is released for folding : the front pin is of the screw type, and is withdrawn by rotating the small handle.

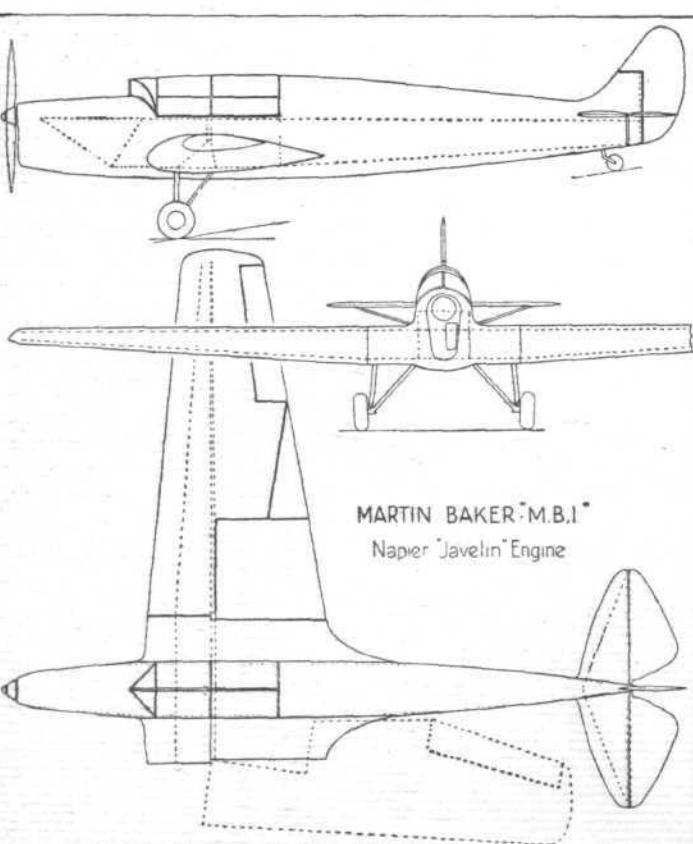
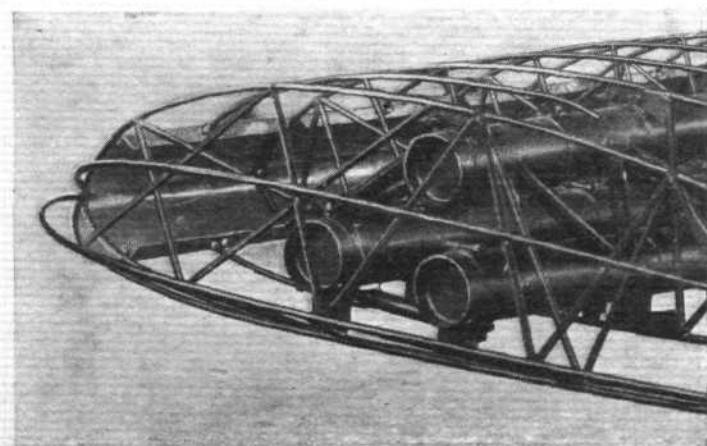
about their position. The seats are comfortable and the cockpit is totally enclosed with an oval transparent hood which can be slid back to allow entrance. The windscreens is a sharp "vee" with vertical front panes, which should not collect fine rain or snow and should obviate any reflection from internal or external lighting.

In the mounting of the Napier "Javelin" engine and its cowling is still more evidence of the practical nature of Mr. Martin's design. The doping pump has connections both to the carburettor and to the induction pipe, the inlet manifold is carefully lagged and warmed, the fuel and oil filters are conveniently placed, and the sides of the cowling can be supported from their hinges in a horizontal position so that they form shields if, as sometimes unfortunately happens, the owner has to attend to the engine when it is running. An electric starter is fitted, and the machine will be very fully equipped throughout.

From an aerodynamical point of view, the "M.B.1" is a fairly straightforward design. As yet no figures are available, but a comfortable cruising speed of 140 m.p.h. and a stalling speed of 50 m.p.h. are hoped for when the machine is fully loaded with two persons and luggage, in which condition the all-up weight will be somewhere in the neighbourhood of 2,350 lb.

It will be seen that the main interest of the machine lies in its detail design, and for that reason we are departing from our usual procedure of delaying this form of aircraft description until we can give full performance figures and photographs of the finished product.

The "M.B.1" is being manufactured at the makers' works at Higher Denham, Bucks.



General arrangement drawings of the M.B.1. The principal dimensions are: span, 37ft.; length, 28ft. 10½in.; chord (wing root), 7ft. 6in.; chord (wing tip), 3ft. 6in.; folded width, 13ft. 2in.; wheel track, 7ft.

Another useful feature is the storage of the fuel in long triangular welded-aluminium tanks placed in the centre of each wing spar, in such a position that, if necessary, they can be withdrawn with a minimum of trouble when the wings are folded. In the cockpits there is again evidence of forethought. The cocks for turning on the fuel supply, isolating the pumps, and for other functions, are all loaded with a spring ball so that there is a definite "click" when they are fully opened or shut, and there can be no doubt

The wing spar consists of three large-diameter but thin-gauge booms, braced by smaller tubes, and converging towards one another at the other extremity.



TRANSATLANTIC

SINCE the earliest days of flying the word "Atlantic" has held a peculiar fascination for the pilot: first, as a mere gap that had still to be bridged by the more intrepid, and then as an area over which the aeroplane might compete, very satisfactorily in the matter of speed, with surface transport.

The first direct crossing, with the Vickers "Vimy," from Newfoundland, was pure adventure; the R.36 showed the way to possible commercial action, and Lindbergh's New York to Paris flight reminded people that the two capital cities of the world might be linked by air in a matter of forty hours or less. But only the airship proved itself capable of carrying any load other than fuel and crew.

To-day the airship is still the only craft that has shown its ability to make regular non-stop trips with a paying load. Every year the *Graf Zeppelin*, which was completed as long ago as 1928, makes her scheduled flights during the summer from Friedrichshafen to South America carrying mails and passengers at three-weekly intervals. Before the end of 1932 this famous ship had carried 10,000 passengers over 329,000 miles.

This year ten flights to Pernambuco and Rio de Janeiro were originally scheduled at fortnightly intervals from May 26 to October 27, and an additional winter service added for December 8. The ship has carried 65 per cent. more passengers than last year on a trip occupying some four and a half days each way.

It would appear that an airship may be the first to make regular journeys across the North Atlantic, for, when the new L.Z.129 is complete, experimental flights will be made to Lakehurst or to Miami.

Every year, however, the heavier-than-air machine extends its "payload range," and to-day the Sikovsky S.42, for instance, has a permissible payload of 1,500 lb. when tanked for 3,000 miles and cruising at 145 m.p.h.

Nevertheless, even this is not really commercial, and

A Brief Survey of Present-day Atlantic Air Routes, and of some Likely Developments : The Seadrome Project

it seems probable that for a number of years a thousand miles will be the maximum economic range of an aeroplane. The S.42 carries a payload of 7,060 lb. over 1,200 miles in still air—and much more if the machine is used simply for the carriage of express freight and mail.

As far as the North Atlantic is concerned, a route could be planned over which the longest "hop" would not be more than 1,200 miles. General Balbo's twenty-three Savoia-Marchettis, for instance, crossed via Ireland, Iceland, and Labrador, and returned from

New York by way of Shediac (New Brunswick) (650 miles), Shoal Harbour (Newfoundland) (500 miles), Azores (1,200 miles), and Lisbon (780 miles). Even so, six trawlers with D/F equipment lay about at various points, and the route is definitely not a permissible one for all-the-year-round operation.

Alternatively, of course, Bermuda, which has been in the limelight recently, as far as the tentative arrangement between Pan-American and Imperials is concerned, might be used. There are already rumours that Pan-American Airways are planning a direct mail service between New York, Bermuda, the Azores, Lisbon, and Paris.

Meanwhile, the Mayo Composite Aeroplane, briefly described in *Flight* of December 6, may provide our own particular solution to the problems of take-off, speed, and range for a long-distance service.

Weather conditions are rather less troublesome in the South Atlantic, and there are two mail services in operation, by Air France and Deutsche Luft Hansa, only one of which, however, is at present an "all-air" route.

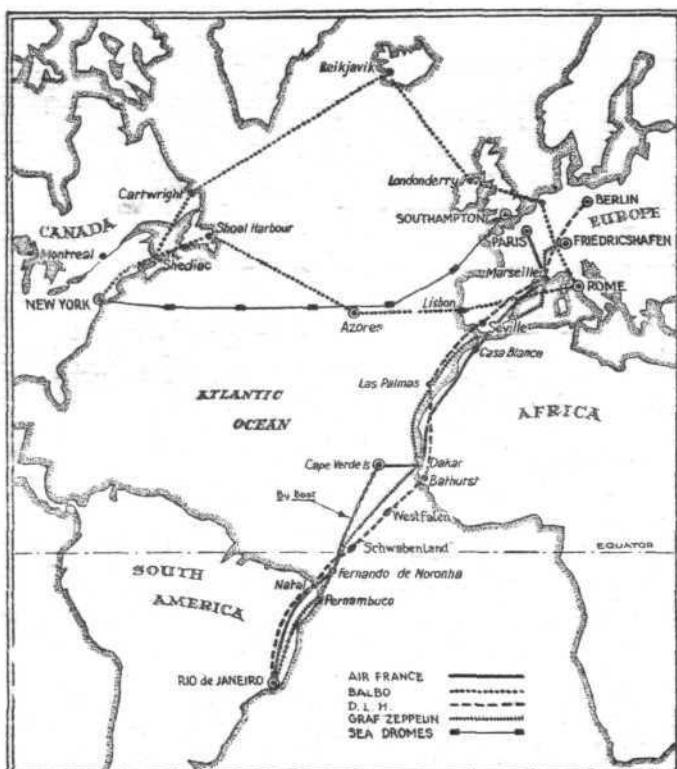
Started by Aéropostale in 1927, and operated since October, 1933, by Air France, the product of an amalgamation of all the original French lines, the mail service from France to South America takes a week, fast despatch boats being used for the actual sea crossing. Although such a service can hardly be included among regular

Atlantic routes, no fewer than eighteen experimental flights have been made, using the Couzinet *Arc-en-Ciel*, the Latécoère boat *Croix du Sud*, and, for the latest flight, the Blériot boat *Santos Dumont*, and there are likely to be developments in the near future. Actually, on one experimental service mails reached Brazil from Croydon in 2 days 5 hours—an overall average of 106 m.p.h.—and it seems possible that before the end of 1935 aircraft will be used for the whole trip.

For the present the immediate plans include the use of the Cape Verde Islands and of Fernando de Noronha, off the African and American coasts respectively. Machines will fly out to and from the mainland, Wibault-Penhoëts being used to Cape Verde and Fokkers to Fernando, and the remaining 1,400 miles of the original 2,100-mile crossing will be made by packet boats until a suitable type of flying boat has been decided upon.

The D.L.H. fortnightly service, opened in February, is not only "all air," but is extremely fast, the elapsed time between Berlin and Natal being less than four days. The 200 m.p.h. Heinkel He.70 mail-carrier is used between Berlin and Seville, where the mail is transferred to a Junkers Ju.52, and Dornier "Wals" are used over the crossing itself.

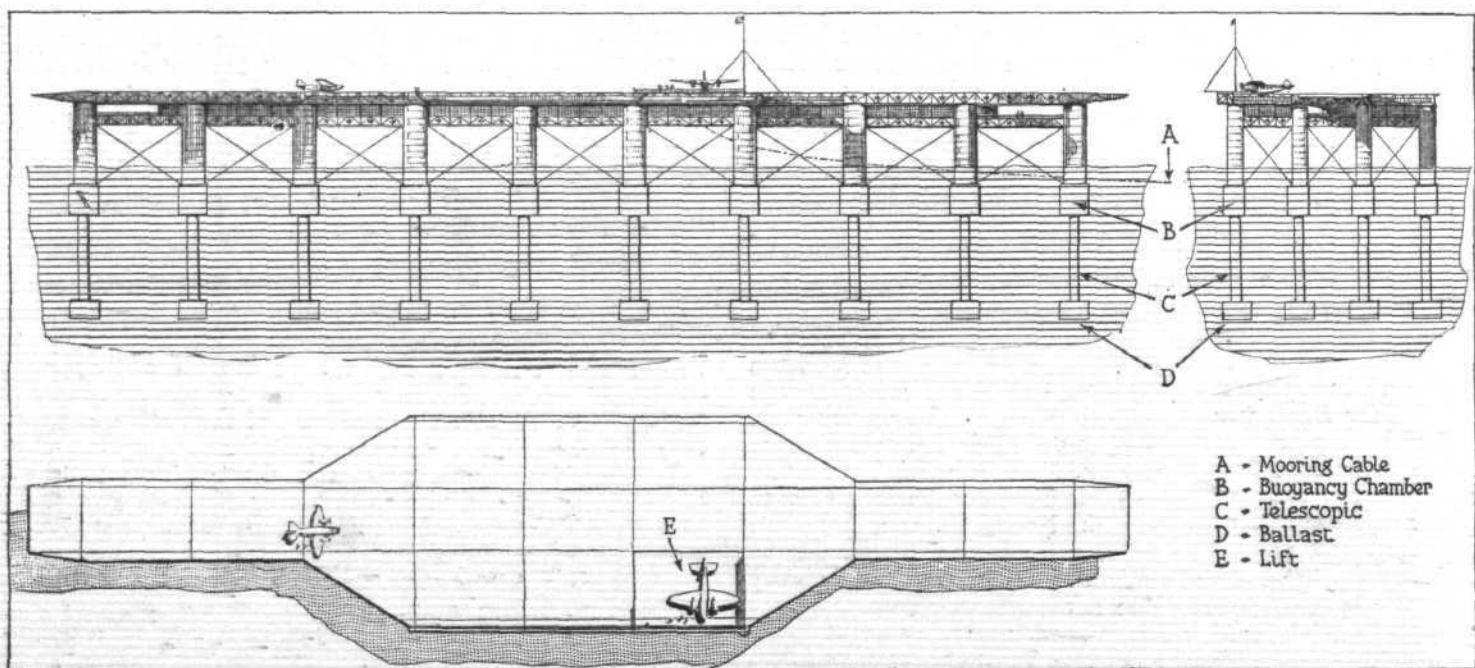
During the season a single catapult and refuelling vessel, the *Westfalen*, has been stationed in mid-ocean, but on the twenty-fifth crossing a second ship, the *Schwabenland*, was stationed some 600 miles from the African coast with the original ship by the American coast. A Junkers W.34 is used between Natal and Rio de Janeiro. Needless to say, direction-finding wireless equipment is necessary for locating the supply ships in mid-ocean, and there is accom-



The routes taken by the South Atlantic services at present in operation, and by General Balbo's round flight. The stages on the D.L.H. service are roughly similar to those on the suggested seadrome route, which is also shown.

—once the safety has been proved.

It is all a question of outlay cost, running cost, and the psychology of the traveller. The airship will save two days or more, and will give the passenger many of the comforts of modern ocean travel, but the service may not be reliable in winter, and the fares will be high. The long-range flying boat will lose some of its small non-stop payload in sleeping and feeding arrangements if the passengers are not to be bored, unshaven and half-starved on their arrival, and the fares must, again, necessarily be high. Furthermore, the most enthusiastic air traveller will not visualise the long sea crossing with any equanimity, knowing that even a flying boat stands very little chance of survival in a mid-winter forced landing. The alternatives are artificial or natural "stepping-stones."



The seadrome layout as it is visualised by the sponsors; the "lower deck" is utilised for all wireless, meteorological and propulsion services as well as for hotel accommodation.

mmodation for three Dornier "Wals" on the new vessel.

Having accustomed ourselves to the use of supply ships and catapults—a system that has undoubtedly proved satisfactory on the shorter Atlantic route—the idea of making even more elaborate plans allowing the use of the (usually) more efficient landplane does not appear quite so extravagant.

Long ago, when Mr. Armstrong originally mooted his seadrome plan, the floating island was neither necessary nor practicable, for the simple reason that the flying machine was not quite reliable or useful enough to merit the enormous outlay. To-day the aeroplane is a serious and necessary form of transport to a great many people, and if three days can be removed from the time of a crossing between Southampton and New York with a fare that is little, if any, higher than that for a normal first-class passage, people are going to use the airway in reasonably large numbers.

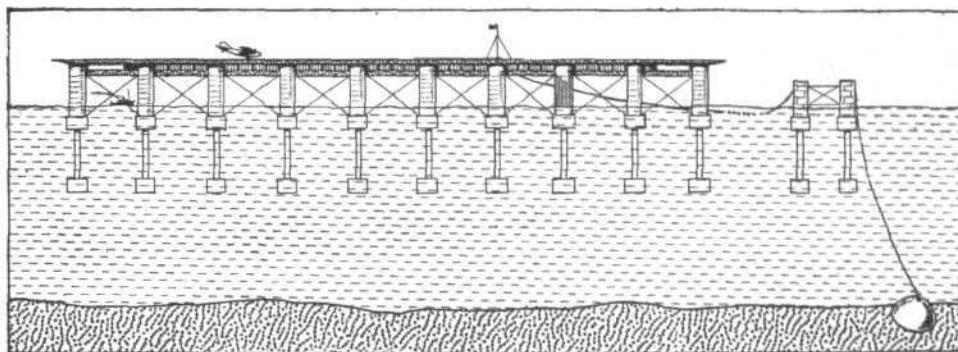
Five seadromes are suggested for use between this country and America, so that the "hops" will be some 500 miles in length—and 500 miles happens to be a convenient distance for the present-day commercial machine. Admittedly, an aeroplane can become a temporary glider as easily during a five hundred-mile flight as during a three thousand-mile flight, but this is where the passenger psychology enters the argument. The thought that a piece of really dry land is never more than 250 miles from the passenger is a supremely comforting one.

There have never been any insuperable difficulties concerned in the design and construction of a suitable floating aerodrome as such, and a few first-class marine and aeronautical engineers would make short work of the seadrome if a demand had been indicated ten years ago.

To-day, Mr. Williams, the official representative of the Seadrome Ocean Dock Corporation, explains that the American Navy Department has recommended a loan of £1,600,000 for the construction of the first example, and he has films showing quite conclusively that a scale model seadrome does everything that is claimed for it in the way of "smooth sitting" in the roughest of rough seas. A model of a large liner ploughs its way wetly and self-destructively through a sea which leaves the seadrome virtually unmoved.

Briefly, the final design consists of a platform 1,500 feet long with accommodation, below the unobstructed flight deck, for passengers and for the meteorological, wireless and workshop equipment. The whole is supported on thirty-two telescopic pillars arranged with air tanks and ballast tanks, so that the centres of buoyancy are well below the surface. These pillars offer very little resistance to the waves. The weight of a fully ballasted seadrome is in the region of 67,000 tons.

Atlantic seadromes would be moored around the 38th



How the seadrome may be moored to a buoy, which could be similar in construction to the main platform, and attached to a mooring in the ocean bed.

or 40th parallel of latitude, where there are no icebergs and where the surface current never exceeds 1½ knots. In a 70 m.p.h. wind the mooring pull would not exceed 100,000 lb. A buoy, similar to the main structure, will itself be attached to an "anchor" at

the sea bottom; as the wind pull changes, the buoy moves up and down, and the actual pull of the seadrome cable remains virtually horizontal. Suspension-bridge type cables are to be used. If by any chance conditions arise in which the pull on the cable exceeds a certain figure, dynamometers will start electric motors, which will counteract this pull. These motors will also be used to manoeuvre the seadrome when the wind is not strong enough to head it, or in a cross-tide.

The difficulties appear to be purely economic. Can the chain of seadromes be shown to be a commercial proposition, and who is to put up the necessary capital? Rough calculations will show that an average of forty passengers every day throughout the year at the suggested toll rates might make the gigantic speculation worth-while.

What is quite certain is that the arrangements will require a set of full-blown diplomats unless the whole thing is made into an international venture. There are most intoxicating possibilities in a truly international air transport company.

The long-range flying boat (using Bermuda and the Azores) and the Composite Aeroplane have a clear start, and it is doubtful whether this country, at any rate, will be prepared to spend comparatively large sums on what appears to be a doubtfully economic project. We shall see. Certainly the cost of a chain of seadromes is not unreasonable when it is compared with the cost, say, of re-equipping the Navy with a few odd dreadnaughts or the shipping companies with one or two luxury liners.

H. A. T.

NUTS TO CRACK

Under this heading, Flt. Lt. Nicholas Comper, A.F.R.Ae.S., will from time to time set out problems or "teasers" which he has encountered in his flying career. The first of these appears below, and the solution will be published in an early issue. Readers may care to send in their solutions.

I WAS an onlooker at a flying meeting at Bourne-mouth some years ago, and a friend of mine had brought down a small two-seater light aeroplane fitted with a twin-cylinder motor. Almost his first question was "Has my racing prop arrived?" I showed him the prop crate sitting in my car, for I had collected it from the station, and helped him to take off the "general purposes" wooden one. We then fitted the special metal prop and ran the engine on the chocks. The revs were O.K., so we sent him off on a practice run round the course.

He had just got off when his engine cut, came on again, cut, and so on, while he edged his way round the aerodrome, on which he managed to make an upwind landing of sorts. We pulled that engine more or less to bits—carburettor, plugs, magneto, valve gear, and all the usual details—but everything seemed in order. So we put the bits back and ran it up again—revs 2,900, and steady, with not a suspicion of vibration.

Once more he set off, but the moment he was off the ground, *phit, bang, phut*, a burst of power, *phit, bang, phut*, and so on. His second landing was more

spectacular than the first, and, taxying in, he asked for chocks for another run up.

That engine ran perfectly! We had checked petrol quantity and feed, had ticked off all the "possibles" and, in fact, had done everything imaginable; so we sat on the grass and talked while an engine expert removed and washed plugs, took the cowling off, put it back, cursed and spat on the ground in despair.

Suddenly someone said: "Since you flew down here has any change been made?"

"Only the prop," the pilot grunted, "but what's that got to do with it? All the same, I'm game to try anything once."

So, with his original prop, he took off, he climbed, he flew flat out, he shut off and he put the power on again. Not a miss, not a suspicion of one! So, time being short, he did a full-throttle run round the course and returned just in time for the first race.

He came in fifth, which did not seem to satisfy him. "Let's try the racing prop again," he said. This time he nearly broke his neck when the engine cut out again on the take-off.

What caused the engine to cut?

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS



TWO-SEATER FIRE POWER—SINGLE-SEATER SPEED : The Consolidated P. 30 two-seater "pursuit" or fighter monoplane believed to be the type ordered by the U.S. Army Air Corps as stated on this page. Fitted with a twelve cylinder Curtiss "Conqueror" of 650 h.p., equipped with an exhaust-driven supercharger, the top speed is about 250 m.p.h.—faster than most single seaters.

Lord Sempill in Papua

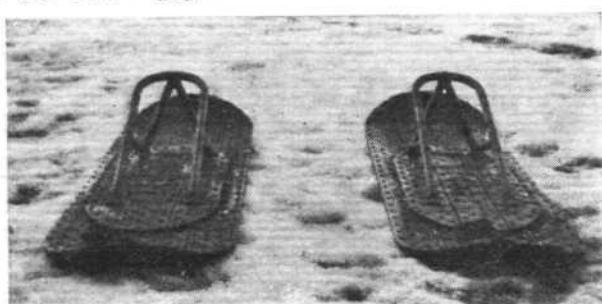
Lord Sempill flew from Somerset, North Queensland, to Port Moresby, Papua, on Friday last, *en route* for the New Guinea goldfields.

Slippers

During a recent visit to Norway a Wolseley-engined Airspeed "Envoy" found thick snow on the aerodrome at Oslo. The temporary skis, shown in the accompanying illustration, were, therefore, made to facilitate take-off, the idea being that they would slip off from the wheels as the machine left the ground, leaving the wheels free for normal landing at the next aerodrome. Incidentally, we understand that the new Wolseley engines ran extremely well throughout the trip, in spite of the wintry conditions, and their easy starting was remarked upon.

France-Indo-China Flight

M. André Bailly, who recently flew from France to Indo-China on a Farman 393, is now on the return flight.



SLIPPERS : The "Envoy's" equipment described on this page.

Believe It or Not !

Strange as it may seem, the same "designer" has had a hand in the construction of the low-wing monoplane illustrated on p. 1342 and the high-wing one on p. 1362. He pleads the season as an excuse . . .

Fast Fighters for U.S. Army

A contract has been placed by the U.S. War Department with the Consolidated Aircraft Company of Buffalo for fifty two-seater fighters, the cost being about £400,000 without engines. It is believed that these machines, which have a speed of 252 m.p.h., are of the P.30 type. This is a low-wing cantilever monoplane with retractile undercarriage, enclosed pilot's cockpit and well sheltered gunner's position. The prototype was fitted experimentally with a 700-h.p. liquid-cooled Curtiss Conqueror, with exhaust-driven supercharger, but it is not known if this engine has been adopted as standard, as the machine was tested at Dayton, Ohio, with a variety of power plants. An "attack" machine basically similar to the P.30, and known as the A.II, has also been produced by the Consolidated company.

—And One or Two More!

The U.S. War Department has also contracted to buy from the Northrop Corporation 110 attack aeroplanes, having a speed of over 215 m.p.h., at an aggregate cost of nearly £380,000. These two orders bring to 241 the total of fast machines bought since the Government arranged to equip the Army Air Corps during the next three years with 600 of the fastest machines obtainable.

Diary of Forthcoming Events

Club Secretaries and others are invited to send particulars of important fixtures for inclusion in this list.

Dec. 29.	Association Football, R.A.F. v. Oxford University, at Ilford.	1935	Mar. 5.	"Problems of Cold Presswork." Joint R.Ae.S. and Inst. A.E. Lecture by Dr. H. Gough and Dr. Desch.
Jan. 7.	"Imperial Air Routes." R.Ae.S. Lecture by Mr. F. Snowden Gamble.		Mar. 15.	"New Developments of the Autogiro." R.Ae.S. Lecture by Señor Juan de la Cierva.
Jan. 29.	Newcastle-on-Tyne Aero Club Annual Dinner and Dance, Barras Bridge Assembly Rooms, Newcastle-on-Tyne.		Mar. 29.	"Piloting Commercial Aircraft." R.Ae.S. Lecture by Sqd. Ldr. H. G. Brackley.
Feb. 8.	"Ice Formation in Carburetters." R.Ae.S. Lecture by Mr. L. P. Coombes.		Apr. 12.	"Commercial Aircraft." R.Ae.S. Lecture by Capt. G. de Havilland.
Mar. 1.	"Fuels for Aircraft Engines." R.Ae.S. Lecture by Mr. E. L. Bass.		May	Wilbur Wright Lecture, R.Ae.S., by Mr. W. D. Douglas.

Wiley Post Not So High

Mr. Wiley Post's claim—mentioned last week—to have broken the world's altitude record, has been rejected at Washington after close examination of *Winnie Mae's* barograph.

Then and Now

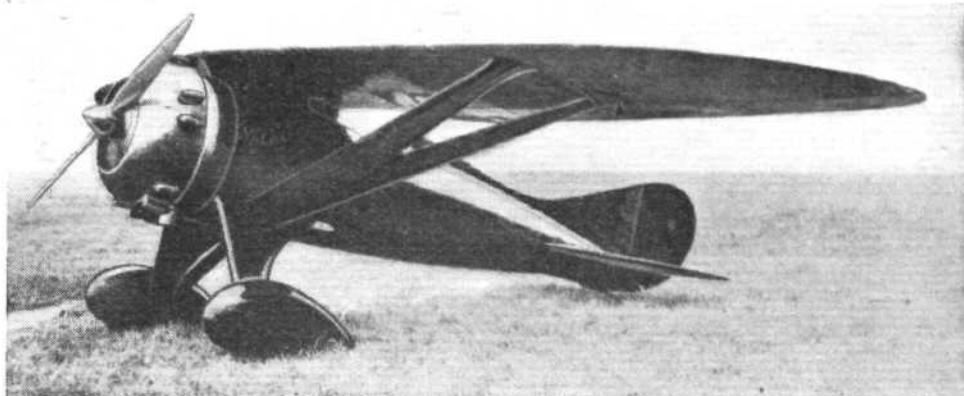
Members of the public who consider five shillings a stiff charge for joy-riding would be interested to see a Hendon programme of 1912. This was the scale of charges: "Passenger flight, two circuits of the aerodrome, £2 2s.; Extra flight, two higher and wider circuits of the Aerodrome, £3 3s.; Special flight, outside the Aerodrome, in the direction of Edgware, £5 5s."

The Spanish at Ifni

Little has been heard in the Press of the Spanish occupation of Ifni, an enclave in the French zone of Morocco, some 100 miles south of Agadir. It was ceded to Spain in 1860, but was never occupied by the Spaniards until last April. The President of the Spanish Republic has explained that Ifni will become important, as it lies on the air route from Europe to South America via Dakar, and that eventually the Trans-Saharan Railway will pass through this territory.

An International Meeting at Brussels

The Societe Amicale Saint-Michel organised an interesting international aviation meeting in Brussels during Tuesday, Wednesday, Thursday, and Friday of last week, in aid of the relatives of Military Air Force victims. A full programme of interesting events was arranged, including "talks" by the following speakers: Col. Comte de Bernardi (Italy), on "High Speed in Aeroplanes"; Commandant J. Dagnaux (France), on "Flights Over Tropical Zones"; M. W. Mittelholzer (Switzerland), on his flights over the Spitzberg, the Kilimandjara, Mount Kenja; and Air Commodore J. A. Chamier (Great Britain), on "Aviation and the Empire." H.M. The King of the Belgians sent a representative to the meeting, at which it is estimated that about 1,500 people were present.



A SPORTS MODEL: The fascinating little Italian Magni "Vale" single-seater, with 130 h.p. Farina engine, which attracted much attention at the recent Paris Show, owing to its beautiful finish and businesslike appearance.

Cathcart Jones for Motor Rally

Lt. Cathcart Jones, who, with Mr. Ken Waller, made such a noteworthy flight to Australia and back, has entered for the Monte Carlo Car Rally.

Twenty-five Years Ago

From "Flight" of December 18, 1909.

"Yet another big step forward in the development of mechanical flight was registered on Thursday of last week, when Mr. Maurice Farman succeeded in flying from his shed at Buc to new quarters at Chartres, a distance of about 42 miles. This was accomplished in 53 minutes, and at an average height of 240 ft. . . . This is, of course, a world's record, but doubtless it will not stand for long."

A Glider for South Kensington

Miss Joan Meakin's Rhön Buzzard glider, with which she has been carrying out demonstrations with Sir Alan Cobham's flying displays, has been loaned to the Science Museum at South Kensington, and has been placed in the National Aeronautical collection, where it forms an interesting comparison with the gliders of Lilienthal, Pilcher, and the Wrights.

Italian Designer Dead

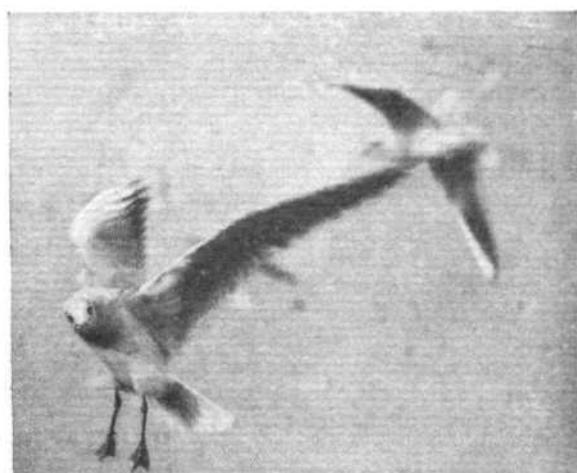
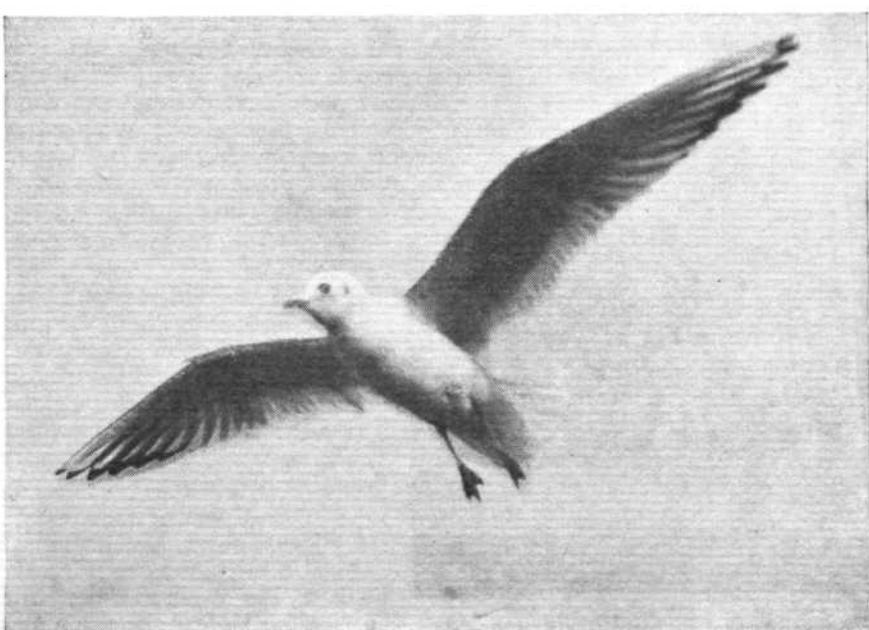
Italy has lost one of its most famous aircraft designers by the death, which occurred at Varese last Sunday, of Signor Giulio Macchi. He was associated with many famous machines bearing his name.

An Aerial Yellow Peril

Lieut-Col. J. A. Sinton, Director of Malaria Survey in India, suggests that the passengers and crew of all aircraft arriving in India from outside should be medically inspected in order to prevent the spread of yellow fever. With the great development of air traffic during recent years the chances that yellow fever might be introduced into India have, he declares, greatly increased.

Petrol From French Coal

The Admiralty and Air Force of France have kept in close touch with the working of the first Coalite plant which was started up at Lens in July, and it is now announced that two works are about to be set up at Lievin and Bethune for the production of oil and petrol from coal. The plans have been approved by the Minister of Labour and local municipalities and work on the enterprise is about to begin at a cost of 40,000,000 francs. Active negotiations are in progress for three further works in different parts of the Continent.



RETRACTILE! These extremely interesting snaps of seagulls' "undercarriage" arrangements were secured by a *Flight* photographer on Blackfriars Bridge, London. Note, on the left, the much discussed wing "thumbs."

THE GATEWAY to the EAST

Part III.—*The Closing Stages of the Outward Journey to Baghdad : Flying Over Hundreds of Miles of Desolate Wastes*

By C. N. COLSON

OUR experience of other aerodromes generally led us to say that we would leave something like half an hour before our intended starting time. By this means we sometimes managed to get the authorities to have things ready for us. At Sirte the laugh was on us, because when we arrived down on the aerodrome at 5.30 next morning, not only was the "Dragon" already out of the large hangar in which it had been stowed for us, but our friend the wireless operator had already got a special weather report from Bengasi, and, moreover, had translated it into English.

The actual area of desert levelled off for the aerodrome is large enough for all ordinary machines, but it is possible to run over the edge with impunity, so there is no need to worry about climbing off it quickly. We set our course straight across the bay to Bengasi, and arrived there without incident after flying over the blue sea for two hours and twenty minutes. The bay is very large, and our direct course practically halved the distance as compared with going round the coast.

Bengasi we will leave until our return journey, because on this occasion we saw nothing except the aerodrome. The latter is large, and our wants were attended to with great promptitude; in fact, we got away in twenty-five minutes, and rejoiced greatly thereover because we had set ourselves the task of arriving at Cairo that day.

As at Tripoli, the various officials and Air Force officers with whom we came in contact all showed personal interest in us and our machine, and their duties were carried out in a spirit of *bonhomie* which was a pleasant change from the officiousness we had experienced at other aerodromes.

Bengasi is not only an Air Force aerodrome but also the headquarters of the Società Anonima Nord-Africa Aviazione, which connects up the Italian possessions in North Africa. There was, therefore, considerable aerial activity when we arrived, especially as the early morning is naturally the most pleasant time of the day for flying in hot countries.

Compared with Sirte, Bengasi is quite a civilised place, but it is, nevertheless, on the edge of fairly wild country, over which, until recently, it was dangerous to fly. Now, however, the Italians have subdued the tribes in the interior, and the normally recommended



Heliopolis racecourse, looking towards the desert.

route is directly across Cirenaica to Tobruch, a long desert crossing on which possible landing places are few and far between. The alternative is round the coast by a very much longer route, but one with the advantage that there are many Italian Air Force landing grounds which could be used in an emergency. We went the direct route and then began to realise the limitlessness of the desert. It was all sandy rock, undulating or hilly, and sometimes covered with sparse camel thorn, a low scrub which is not easily visible from the air.

Occasionally we saw signs of cultivation, where something is grown during the rainy season, and once we passed over a small village; unfortunately it was some little way off our course, and we were unable to examine it closely. Twice we saw camel trains, and once we saw a band of Arabs riding their camels at a furious pace away from their tents towards another band similarly mounted. Whether it was a raid party or merely a game we could not wait to see, but we felt that in any case we were better out of it.

About half-way across there are some dried-up salt lakes which are a very good landmark, as they lie close to and a little south of the course. In the shimmering sun of the forenoon they looked exactly as if they were filled with water.

We had been blessed with a nice strong tail wind since leaving Sirte, and on this stage had hopes of making Mersa Matruh the first stop in Egypt without landing at Tobruch. Unfortunately, that wind

was not quite strong enough, and when we reached Tobruch, which luckily lay right on the course to Mersa Matruh, we decided that we should be cutting it too fine as regards our fuel supply if we did not land and fill up. This meant, at the very least, another twenty minutes wasted, but we could not afford to risk a forced landing in that part of the desert!

Tobruch is the last station of any size in Italian territory. It has a large aerodrome, but apart from very extensive air-



The impressive Y.M.C.A. building in Jerusalem.

port buildings and accommodation for the officers and men there is only a small village and seaport. The wireless station is large, and it would appear that the Italians attach some considerable importance to the place. The Shell man was ready for us, and the Customs helpful as usual, so that we were ready to go in twenty-five minutes.

We now had to decide whether we could reach Cairo or not, because there is nowhere between Mersa Matruh and Cairo where a night can be spent. There are one or two R.A.F. landing grounds along the coast towards Alexandria, but they are merely levelled patches of ground. We decided it might just be done, and so pushed on as quickly as we could. From Tobruch we had to fly straight across the desert for some way until we reached another Italian station close to the Egyptian border, where we had to show our registration letters so that they could check us out of Libia. After that we went straight on down the coast. The desert now began to change, and instead of the rocky barrenness we had seen below us previously there was just sand. Miles and miles of sand, hot, uninteresting and limitless-looking. Sometimes it appeared fairly firm, but as often as not it was merely like the sand dunes of Norfolk on a much larger scale, and a forced landing would fairly certainly have meant standing the machine on its nose. Near the sea there were one or two bands of nomads gathered round their tents, which were nestled in hollows showing evidence of some attempt at cultivation; but apart from these we saw no signs of life at all.

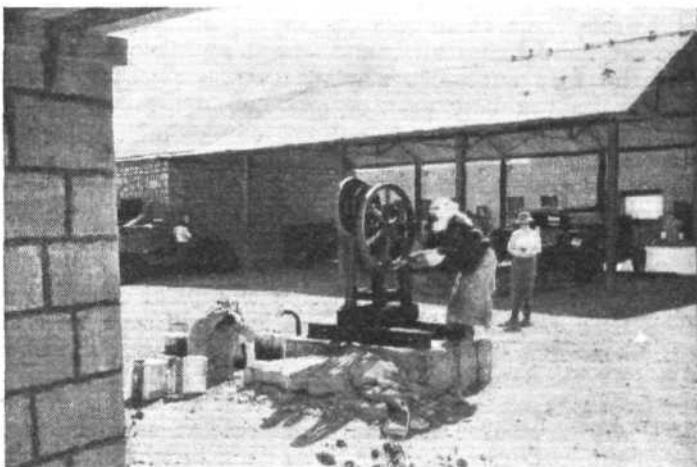
Mersa Matruh was quite a cheery sight for sore eyes after all that desert. The little town looks bright, and we were told that the hotel is quite good, as is the bathing in the lagoon between a narrow spit of land and the sea. Pilots are advised to circle the town so that the petrol agent hears them and comes out to the aerodrome. We did not know this and, being in a great hurry, we simply landed with as little waste of time as possible. Then we had to wait. We managed to make the watchman understand what we wanted, although his knowledge of English was very little more than our knowledge of Arabic, and that is very elementary!

Filling in Forms

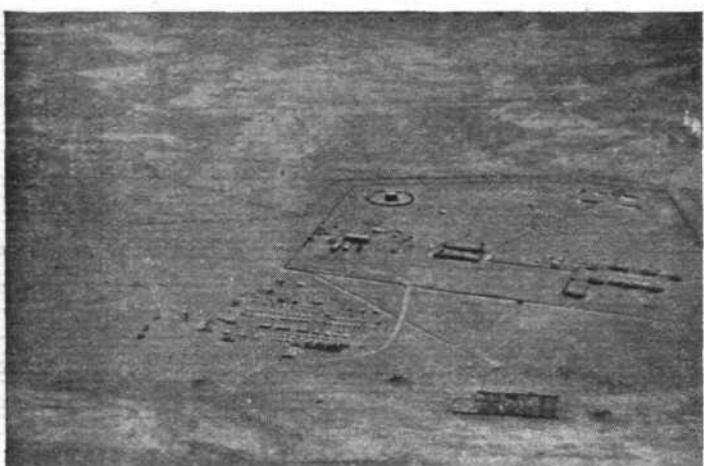
He telephoned in and after a while a figure came pedalling a bicycle across the aerodrome. We waited expectantly but it was only another Arab, who hopefully pointed to the word "Vacuum" writ large across the front of his jersey! More explanations followed and eventually the people we really wanted came in cars, which they drove, regardless of camels and donkeys, straight across the ground at the side of the aerodrome.

We thought by this time that we knew something about papers and their signing, but we found we hadn't even started to learn. Not only did we have to cope with a long and searching Customs examination—which we learnt afterwards could have been avoided if we had declared in a determined manner that we were going to clear at Cairo—but there was also the matter of passports and the doctor's department to be satisfied.

The former was much the same as everywhere else, and merely consisted of covering most of the remaining available space in our passports with the impressions of elaborate-looking rubber stamps. The latter must have been designed to test the tempers of hurried pilots. First of all we had to produce a bill of health to show that our last port of call was a healthy one. That was all right, but when the official showed us a foolscap sheet, covered on both sides with questions which had to be answered, and, moreover, intimated that we had to pay 100 piastres, that is, one pound sterling, for the honour of doing so, we did get a trifle ruffled. We would not have minded so much if the questions had been serious, but it gets one down, so to speak, to have to declare the number of rats on board a "Dragon," or whether you have any coffins on board or are disembarking any bodies! Actually the forms are merely the same as those used for ships, and we live in hopes that by the next time we go there they



Reading from the top downwards, these photographs show the hills around Bethlehem, Rutbah Wells fort, the actual wells in the fort, and Arabs at Rutbah watching the arrival of a car from Damascus.



(Above) Desolation and isolation—one of the pumping stations along the desert pipe-line. On the right is a map showing the final stages of the flight.

will have realised that half an hour wasted on an aerodrome means a delay, in miles, of at least fifty, whereas at sea it may mean only five.

Landing fees were not very heavy, as both here and at Almaza we had to pay only eleven piastres.

All this bother set us back just over an hour, but we still thought we could make Cairo, so, without waiting for fervent handshakes all round—we took the photographs on the way back—we started up and took off again. Cairo lies the best part of one hundred miles up the Nile from the sea, so the direct course took us across over two hundred miles of desert. For the first hour or so we were not far from the coast, which runs south-east for some way and therefore nearly parallel to our course. We saw a fair amount of primitive cultivation near the few villages; some of it was merely signs of working the soil, but in other cases consisted of clumps of date palms. As we got farther in, all this was lost, and soon we were racing the sun over sand which for the most part looked too soft for forced landings.

There was no need for worry even if we did not arrive until dark, because Almaza aerodrome is well equipped for night landings, having a large neon beacon, boundary lighting, and a landing floodlight. However, Morton had not been there before, and it is always better to land for the first time on a strange aerodrome in daylight.

Cairo Reached

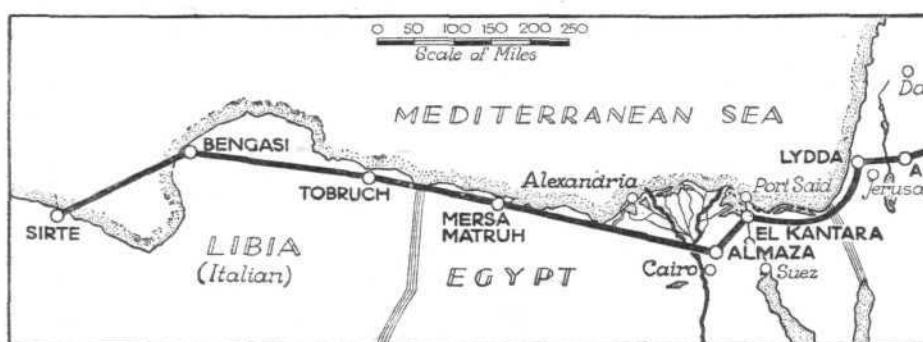
We just managed it; flying fairly low over the cultivated area of the Nile delta as the sun was setting we watched the lights begin to twinkle in the villages, although the details of the houses were by that time lost in the rising mist; and, finally, we arrived at Almaza to land comfortably just before darkness shut down after the longest day's flying we had yet done. The Egyptian Customs authorities and those who take a delight in stamping passports were easily contented, although there were further forms for each passenger to fill in about his health and such matters. The landing fee was only eleven piastres.

The aerodrome itself is excellent, being large enough for the fastest-landing machine and having perfectly clear approaches. Misr-Airwork, Ltd., which is associated with Airwork, Ltd., of Heston, run the school and repair works, and everything to do with overhauls or maintenance can be undertaken by them. They have two large hangars there, but the Egyptian Government, under the direction of Sir Quintin Brand, the Director General of Aviation, has recently erected another large one to cater

for the increasing number of civil aeroplanes which are passing through Cairo on their way south and farther east.

As may be imagined, we were tired and had had enough of flying for that day, so very soon we were in Heliopolis, at the Heliopolis House Hotel, a well-known meeting-place for pilots. Heliopolis is about seven miles from Cairo, which is reached by a hectic ride in the "Metro," a tram-cum-light-railway which crashes along at an incredible speed, always threatening to throw the passengers out of its windows, but never quite doing it. We decided to stay at the "House," first, because we knew we should meet many friends, and, secondly, because it would be handy for the aerodrome next morning.

I wish I had the space to draw a picture of Cairo, for it is so essentially the sort of city which "gets" the traveller who likes to look under the surface rather than be led away by superficialities. Mind you, it isn't Egypt—not until you dig very deep—because its life and soul are tourists. Everything is for their benefit, and all the "window-dressing" has to be swept aside before the true



city is reached, but it is there and it's well worth digging for.

Perhaps the first impression a new arrival obtains is that of silent-footed, red-slipped forms flitting about in white night-shirts. Every contact he has with the Egyptians themselves—except on the aerodrome, where the officials wear European dress with a red fez—until he reaches the babel of the bazaars, strengthens that first impression. The servants are noiseless and just flit about.

Talking of flitting reminds me of that modern commodity without which no one should travel east of Malta, certainly not in an aeroplane. "Flit," whether the original or one of the many other similar preparations, is a necessity. On most aerodromes we found that after a few minutes on the ground our "Dragon" was full of flies. Swatting them with a whisk did some good, but one of those portable "Flit" outfits was the best. In the hotels as well, especially in October, it is very useful, because many hotels have by then put away their mosquito nets, and fresh English bodies seem to be the signal for another hatch of those tormentors of the night.

We decided that we need not hurry unduly next morning, as we could not get farther than Jerusalem unless we were content to arrive in Baghdad after sunset; and, as we had already caught up our schedule and would arrive in Baghdad on Wednesday afternoon, two clear days before the race, we thought it more sensible to do it in comfort.

That night Mackinnon and I entertained a very old friend of mine to dinner at the Mena House Hotel under the shadow of the pyramids at Gizeh. Mena House is beloved of all romantic novelists, but that night the small mosquitoes were so thick that dinner outside in the gardens was anything but romantic; Mackinnon and I smoked and swatted hard, but my friend came off best, as she, knowing from experience what to expect, had brought a pillow case in which to put her legs while we fed! She fed in peace and the mosquitoes fed on our ankles!

Next morning we had to sign only two or three forms each before we were allowed to go. On the way, over a corner of the desert east of Cairo which we traversed en route to Ismailia, we were escorted by a friend of Mackinnon's in an R.A.F. "Atlas." This bit of desert is bad and soft and offers no place for forced landings although it is so close to civilisation.

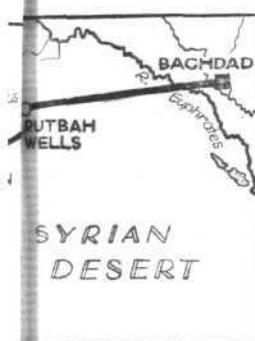
Ismailia still has the large airship mooring mast stand-

ing high on a corner of the aerodrome, and seeing it made us feel that there is a very great deal to be said for the idea of passengers travelling in comfort, day and night, by airship. I feel we shall live to regret the day that we allowed steam-rollers to be used for flattening the remains of R.100 while other nations carry on their experiments with this form of transport.

Ismailia is close to the Suez Canal, but we had to follow it farther north to El Kantara, at which point private aeroplanes are allowed to cross it. Port Said, on its narrowest of narrow spits of land at the mouth of the Canal, was just visible, shimmering and suggestive of filth.

Following the coast and/or the railway then led us past El Arish, a new Egyptian Government civil aerodrome, and Gaza, the Imperial Airways stopping place, up into Palestine, where we began to see green again as the orange groves around Jaffa came into sight. Incidentally, the desert south of El Arish is the Sinai Desert and has the worst possible name among pilots, because there is so much of it which looks hard but which is in reality soft and therefore dangerous for forced landings. Besides this, it is largely trackless and, while there is just a chance that anyone remaining by a stranded aeroplane might be found, it is certain that anyone straying away from the machine would die of thirst.

There are two aerodromes close to Jaffa, which town, despite its large orange trade, has no port; the fruit has to be ferried off to the ships in boats. One is Ramleh, an R.A.F. station and the headquarters for Palestine and Transjordan, and the other which has only recently been made, largely



Taken while refuelling at Rutbah. Left to right are Mr. Jerry Nairn, of Nairn Transport, Mr. Graham Mackinnon (owner of the "Dragon") and a friend of all pilots, who has the isolated job of wireless operator at the fort.

as a result of the representation of Airwork, Ltd., at Lydda. The latter ground is only two crossing runways of flattened earth; they are very good when dry but I imagine that they will want considerable attention before they are fit to use in all weathers.

The Palestinian Government is taking a serious interest in aviation, and quite large developments have been hinted at. Its officials are keen, and we were certainly given every help possible. The Customs official, in particular, waived his usual working hours and did not need much persuasion before he agreed to come out and clear us for taking off at dawn the following morning. We were grateful to him because we were then getting fairly far east, and the farther east you go the harder it is to get people to put themselves out for you. The police, fine-looking Arabs and Palestinians, even sleep out on the aerodrome so that no harm shall come to visiting aeroplanes! We thought that was rather self-sacrificing of

them after we had seen three nice plump scorpions in the writing table drawer in their tent!

We only landed at Lydda because there was no aerodrome nearer to Jerusalem which we could use. Jericho is nearer, but the down-draughts are so severe there—Jericho is in the Jordan valley at the foot of the hills east of Jerusalem—that they have caused many accidents, and we did not want to ask for trouble with our rather heavily loaded aeroplane. This entailed a car drive (American cars, unfortunately) of just over an hour to get to Jerusalem itself. We got there with about an hour's daylight to spare, and so dutifully got hold of a guide, through the obliging Mr. Fast, Misr-Airwork's agent, and went to see some of the Holy relics.

The world seems to be divided into two factions: Those who like to parade their religion—and the more blatantly they do so the more holy they feel—and those who follow an ideal, Christian or otherwise, as well and as quietly as they can. Jerusalem caters for the former. I do not decry or criticise them for it. It is their nature to worship blatantly, and they do it with their heart and soul, but I feel sure few persons of an idealistic class will feel any the better for having made a tour of Jerusalem. Still, we were glad, in spite of the long ride, to have had the opportunity of seeing for ourselves some effect of all the money which is being poured into the country. We would have liked to visit Tel Aviv, the real centre of Jewish colonisation, but even in Jerusalem and Bethlehem, to which we drove the same evening, we were able to see many of the improvements which are being carried out.

Over the Jordan Valley

We got away at dawn the next morning and caught the sun rising over the hills east of the Jordan valley when we were above Jerusalem. I doubt if people who only know this country from reading their Bibles realise how hilly it is. I tried to take some photographs to show this as we passed over, but the rapidly rising heat haze, and the bumpiness of the atmosphere made it rather difficult to get anything worth reproducing. The Jordan Valley leading down into the Dead Sea, which lies so much below sea level, is a wonderful sight. For biblical reasons I had always imagined that the Jordan was a large, slow-flowing river, but below us all I saw was a narrow, winding stream sunk in the middle of a wide cut through the hills. Probably it grows quickly in the rainy seasons. The Dead Sea has chemical works on its sides, and at the head we saw many pans wherein the water is evaporated to leave salt.

As we approached Amman the country became more mountainous, and near the R.A.F. station it was very rugged indeed; there was practically no vegetation, just barren hills of rock and sand, which looked hostile to man and extremely hot. I thought of the ghastly privations Lawrence must have endured on his heroic journey through this terrible part to Deraa and Damascus. No man can have received less for the part he played in history than has Lawrence.

The wind had turned against us soon after leaving Lydda and it was now evident that we could not carry on right through to Rutbah Wells, which was somewhere about another 260 miles into the desert, without a risk of running short of fuel. So we landed at Amman. There Group Capt. F. L. Robinson and his adjutant, Flt. Lt. D'Arcy Greig, were extremely hospitable and insisted on us enjoying (most decidedly so) a large and very English breakfast. It took rather a lot of persuasion to get the Shell agent to hurry, but eventually he was hauled up from the town with his lorry and we were refuelled from tins. After a long run the downhill way of the aerodrome we started a sluggish climb, for it was now getting hot, over the eastern hills to the real desert.

We were now over the portion which the R.A.F. pioneered for the Baghdad Air Mail just after the War, and which has been so graphically described by Wing Com. Roderic Hill in his book, "The Baghdad Air Mail." I advise everyone who wants to know more about that desolate plateau stretching east of Amman (and which

Wing Com. Hill points out cannot truthfully be called a desert, yet is even more desolate) to read that book. In this article I can but describe a few of its chief features. South and west of Amman lies Mount Nebo, from which Moses is said to have viewed the promised land. Farther east there is little of distinction. The whole area carries very little soil and, more often than not, simply has a covering of flinty gravel, which at times shows orange or red where there is some sandstone mixed with it. Farther still is the even more desolate stretch of basalt country, where many small craters of extinct volcanoes are to be seen; truly has that region been called the "epitome of loneliness, which fills the traveller with sinister foreboding."

In places there are level areas formed by the deposition of fine mud and sand which has been carried down from the surrounding hillocks by the rains, often torrential in the season. These flats form excellent landing grounds for aeroplanes, except that at times they reflect the sun almost like a mirror; then it is as difficult for the pilot as landing on a glassy sea, because he cannot judge the height he is from the ground.

The original air mail route is not the route we took, although I believe the oil pipe-line, which formed an excellent guide for a large portion of our journey between Amman and Baghdad, does for some distance follow the car tracks, which were the leading marks laid down for that pioneer work. The line or the tracks are fairly easy to follow across this region, but a pilot who ignores them and flies entirely by his compass is likely to become lost.

The last stop before Baghdad is Rutbah Wells. Around

these wells a fort has been built by the Iraq Government, and a wireless station established. Part of the fort has been fitted out as a rest-house and restaurant by the Nairn Brothers, who run an amazingly efficient motor car service across the desert from Damascus. They also cater for Imperial Airways passengers, as the machines of that Company stop there for fuel. The fort appears to be of the kind everyone has seen in Foreign Legion films, but inside, out of the glare and heat, it gives the traveller a shock to find that he can get a glass of iced beer—though naturally he has to pay a fairly high price for it. We had to pay 500 fils., or ten shillings, for landing on the aerodrome, and another five shillings for the pleasure of allowing Imperial Airways to fill our "Dragon" with fuel.

The story of Nairn Transport has yet to be written, but they are the true pioneers of that desert crossing, and it will make a fine story whenever it appears.

Onwards from Rutbah Wells the desert continues, and except that it is softer and more sandy in places differs but little from that over which we had already flown. After about two hundred miles we came to the River Euphrates, down which we flew, resting our eyes on the increasingly large patches of green on its banks as we got nearer. Finally we cut across a corner where the river bent a bit northwards, and landed at Baghdad's new civil aerodrome just before 3.0 p.m.

Next week I shall describe some of the places through which we passed on our return journey, for we altered our route a little as compared with the outward one.

(To be continued next week.)

THE ASBOTH HELICOPTER

Arrangements made for Development of Promising Austrian Design in this Country

GIVEN positive control and perfect autorotation, so that a helicopter remains a perfectly safe aircraft even when its engine is stopped, the problems affecting the production of a flying machine suitable for the use of the general public become relatively simple. The ability to hover is the one feature which, with the present state of science, would make flying in conditions of extremely bad visibility a possible and comparatively safe procedure. We have always maintained that there is practically no analogy between flying in normal aeroplanes and motoring, but if the claims made for the Asboth helicopter are substantiated we shall be prepared to alter our opinion.

This helicopter has created very considerable interest both in Austria—where for twenty-five years Mr. Oskar Asboth has been closely connected with aeronautical development, and where he was Director of the Central Experimental Station—and also in Germany; furthermore, it is now announced that arrangements have been made with Mr. Robert Blackburn, managing director of the Blackburn Aeroplane and Motor Co., of Brough, for its construction in this country.

The Asboth helicopter is not entirely untried, as four machines have been constructed, upon each of which a considerable number of flights have been made, all commencing with a vertical ascent and finishing with a vertical descent under perfect control.

In 1931 Mr. R. N. Liptrot, a technical officer of the Air Ministry at Farnborough, carried out personal trials with this machine, and his findings were published in the Journal of the Royal Aeronautical Society in July of that year. At that time the problem of autorotation had not been entirely solved, but in September, 1933, there were submitted to the Royal Aircraft Establishment at Farnborough some further designs which are said to give a perfect and practical solution of this problem.

It would seem, therefore, that a very considerable step forward has been made in the production of the foolproof flying machine which will rise and descend vertically under perfect control. At the present time the design is

in a state of flux, and it has not yet been decided by Flt. Lt. N. Comper, who is technical adviser and chief designer for Mr. Asboth in England, what form the helicopter to be built in this country will take. Basically, however, it must include a horizontal airscrew driven from an engine in the body, which will also drive a propulsive airscrew.

A film of the early trials was shown at Bush House last Monday.

The Victors' Return

Mr. C. W. A. Scott and Mr. T. Campbell Black, the winners of the England-Australia Air Race, arrived back in England last Friday evening. They were welcomed at Victoria Station by Lt.-Col. F. C. Shelmerdine (Director of Civil Aviation), Lord Gorell (Chairman of the Royal Aero Club), the Hon. Richard Linton (Agent-General for Victoria), representatives of the De Havilland Aircraft Company, many personal friends, and cheering crowds.

Their journey home was made by sea to Naples, and thence to England via Paris by train. During a break in their journey at Paris on Friday they attended a reception given in their honour by *Le Figaro*.

On Friday evening, after their arrival in London, a reception was held for them at Grosvenor House. There they received an even more tumultuous welcome, which was repeated when they were persuaded to look in at the Motor Trades' Association Golfing Society's dinner, which also was being held in Grosvenor House.

On Saturday they were entertained at a dinner given in their honour by the *News-Chronicle*, Sir Walter Layton being in the chair. Among those present were the Rt. Hon. S. M. Bruce, High Commissioner for Australia, and Lt.-Col. F. C. Shelmerdine.

Both Mr. Scott and Mr. Campbell Black have been elected honorary life members of the British Empire Club, at which a reception was held for them on Tuesday. On Wednesday night they were the guests of honour of the Royal Aero Club.

PRIVATE FLYING

A SECTION FOR OWNER-PILOTS
AND CLUB MEMBERS

SINCE I was last in Rome great changes have been made. Whilst the historic centres of interest remain no less interesting to the tourist, much has been done under the new regime to make Rome more attractive. There is no doubt that Italy is going through a period of revitalisation, and this is seen in many directions. Not content to rest on the glories of the past, the energy of the younger generation, who, incidentally, form a large proportion of the population—some 45 per cent. consisting of persons under twenty years of age—is altering the whole character of the national life. Great progress has been made in industry, commerce, agriculture and communications during the past decade.

Particularly is the new spirit noticeable in the zest with which all kinds of sport is being taken up. Some of the finest sports stadiums in Europe have been constructed within recent years at the chief Italian centres, and Rome, with the new Mussolini Forum and the National Stadium of the Fascist party is well to the fore in the new cult.

This is not the place for a lengthy description of the new sport-loving era which is marking the renaissance of modern Italy, but this brief mention will give an indication of the new spirit which is animating the country. This is no less apparent in aviation, although private flying has not yet made progress comparable with that in certain other countries.

Developments in Italy

THE Royal Aero Club of Italy is, however, seeking to improve conditions in this connection, and more rapid development can be expected. Commercial air transport is, however, forging ahead and services to all parts of the country radiate from the capital. Whilst routes run along the whole length of the country on both the west and eastern sides, several services cross the Apennines, in particular those between Rome and Venice, both direct and *via* Florence, and from Rome to Brindisi *via* Bari.

Rome is also connected by air with the great cities of the north, Genoa, Turin and Milan. From Venice there is an extension to Vienna and several air lines run across the Adriatic, notably to Trieste, Fiume and Zara. From Rome, too, many lines branch off to the South connecting Sardinia, Sicily, Tunis and the Italian Colonies of North Africa. Other external air services run to Constantinople, to Algeciras in the South of Spain, and there is also a route from Tripoli along the North coast of Africa as far as Tobruk.

Italy may be said, therefore, to be in the forefront of European nations as far as air transport is concerned.

To proceed with my journey, however. Petrol is dear in Italy, but having arranged to fuel by the convenient Carnet system, this will not be brought home to me until the end of my tour. As Lt. Comm. Colson is so graphically describing his recent flight to Baghdad, part of which

was made over my own route, I will pass rapidly over the journey between Rome and the "City of the Caliphs."

Taking off from the "Eternal City" rather late in the day, I could not hope to get farther than Brindisi before nightfall, so I decided to spend the night there and proceed to Athens on the following day. Before leaving Rome the officials had made rather a fuss about my leaving for Brindisi, as they asserted that the aerodrome was dangerous. I found it better than I was led to expect, and have landed on many worse. There being no hangarage facilities, I had to moor my machine in the open for the night on this occasion.

Having renewed acquaintance with several old R.N.A.S. friends on Imperial Airways' staff, I set off for Athens the next morning, passing over Corfu and the Gulf of Corinth. As there was a head wind, it took me five hours to reach the Grecian capital—longer than I expected. I spent the remainder of the day checking up, cleaning filters, and so on, ready for the long sea crossing to Alexandria on the morrow.

For this section I fitted my tanks, including the auxiliary, brim full; this is an operation I like to supervise myself.

I find that with a full load of petrol my machine is capable of 8½ hours' flying, so that I hoped to make Cairo non-stop. The flight across the Mediterranean was uneventful. Setting my course carefully, I hit Crete at the right spot and sighted the African Coast after 5 hours 20 minutes flying. As soon as I came within sight of the land, the engine running well, I altered my course direct for Alexandria, arriving there in 6 hours 15 minutes.

After making such good time I carried on and reached Cairo according to plan, the whole distance from Athens taking 7½ hours. In a continuous flight, such as that involved in a journey to Australia, there is little time in which to keep the machine as clean as one would like, so that, as it was raining when I was half-way across the sea, I went through a few storms in order to wash the machine well.

There is much of interest to describe at Cairo, and the good work being done for commercial and private flying by Misr Airwork might well be referred to at length.

A Night Landing

I MUST, however, pass on. After a day in Cairo I continued my journey at dawn, after changing over to a heavier grade of oil. The section between Cairo and Baghdad is one on which it is easy to lose one's way, and, encountering poor visibility, I did not cover the distance as quickly as I had hoped. It was, therefore, dark before I arrived at Baghdad, and I had some little difficulty in finding the aerodrome. I flew round a little, putting my lights on and off to attract attention. Not receiving any response I decided to land with the aid of a hand torch. Just as my wheels touched the ground on came the landing lights. I should, of course, have flown round a little longer to give the ground staff more time.

FROM THE CLUBS

Events and Activity at the Clubs and Schools



THE BROOKLANDS DINNER : The group includes Flt. Lt. Tommy Rose, Mr. Percy Bradley, Capt. Duncan Davis, and Mr. Clifford Molli- son, the actor.

BRISTOL AND WESSEX

The weather during last week was surprisingly good, enabling members to make cross-country flights to Brooklands, Teignmouth and Portsmouth.

The Bristol and Wessex Aeroplane Club are holding their annual ball on Friday, February 15, at the Grand Spa Hotel, Clifton, for which a well-known London dance band has been engaged.

LINCOLNSHIRE

Some useful comparative figures have been given by the Lincolnshire Aero Club for the years 1933 and 1934, and these show a very encouraging all-round increase in activity. At the conclusion of 1933 there were 180 members using four machines, and the amounts of dual and solo were 140 hours and 39 hours respectively, with taxi trips totalling 98 hours. Now there are 240 members and five machines, and this year 190 hours' dual, 95 hours' solo and 98 hours of taxi flying have been done.

Seven new pupils have joined during the month, and two first solos have been made by Messrs. Grice and Brooks. Sunday tea dances are now held in the clubhouse. The aerodrome, which has, incidentally, been purchased by the Grimsby Corporation, is being extended. The third annual dance will be held on January 10 at the Gaiety, Grimsby, and on December 28 there will be a Christmas party in the clubhouse.

READING

A most successful supper dance was held at the Reading Aero Club on December 8, and dancing continued into the small hours. Everyone was entertained by the cabaret turn of Mr. Shea-Simmonds, who mystified with his sleight of hand and illusions. Other amusements included memory tests of particular aviation articles contained in a box, some of which were technical enough to be puzzling. All hoped to win the appropriate prizes—bottles of wine and cigarettes.

The next is to be a gangster and apache dance, to which it is hoped people will come looking really tough. It is to be held on Saturday, January 5. For Christmas the club is arranging a house party, the programme for which includes all the festivities of the season, with the added attraction of a paper-chase and indoor treasure hunt.

Full service for private owners will be available during the Christmas holidays.

BROOKLANDS

Two new members started instruction at the Brooklands Flying Club last week, and Mr. Hill commenced an instructor's course. On one afternoon three instructional machines were cut off from the aerodrome by sudden fog, and made emergency landings. On alighting the pilots found themselves surrounded by strange animals: they had landed in a private Zoo!

Mr. Ashton is now installed in his new lecture room, and his pupils are benefiting by the up-to-date equipment. The school is closing for Christmas from Monday, December 24, to the morning of Wednesday, January 2.

The annual Works Dinner was held at the Ship Hotel, Weybridge, on December 14. In the course of a short speech Capt. Duncan Davis pointed out that whereas in 1933 they had 80 pupils and flew 3,934 hours, in 1934 the number of pupils had increased to 114, and the flying hours to 5,665. Of the 28 pupils from the College of Aeronautical Engineering, 26 were in jobs and the remaining ones were too young.

CINQUE PORTS

Last week four members successfully passed their "A" licence tests, and two new members joined, both, incidentally, ladies. The flying last week amounted to 23 hours, which was about all the weather would allow.

The club has now increased its fleet of aircraft with the addition of yet another Gipsy I "Moth," so there are now four Gipsy I "Moths," one Cirrus III "Moth," and one "Leopard Moth." Mr. D. Stewart, late of the College of Aeronautical Engineering, A.S.T.'s, and Saunders Roe, Ltd., has joined the club as engineer.

The club is holding a dance at the Grand Hotel, Dover, on January 7, and it is hoped that all members and friends will turn up.

BOMBAY

The total flying times at the Bombay Flying Club for October were 331 hr. 45 min., of which 79 hr. 30 min. were flown in Bombay and 252 hr. 15 min. by four club aeroplanes flying from Berlin to Bombay. On the termination of this instructional flight on October 16, the pilots were accorded a civic welcome. Telegrams of congratulations were received from H.E. the Viceroy, H.E. the Governor of Bombay, the Director of Civil Aviation, the Assistant Director of Civil Aviation, the De Havilland Aircraft Co., and many others. Owing to the success of this flight it is proposed to organise a similar flight during the next monsoon with, it is hoped, eight machines.

Mr. A. C. Gazdar is now fully qualified as an instructor, and has recently passed the Blind Flying test and Instructor's test at Air Service Training in England. The club had twelve "ab initio" pupils under instruction, of which five are under training for their "B" licence, at the close of the month.

LONDON

The first to be held since the move from Stag Lane to Hatfield, the annual dinner of the London Aeroplane Club last Friday was an occasion of the greatest satisfaction to all members. The club's committee is wiser than many, for they never spoil their members' digestion by making them sit through a plethora of speeches!

Maj. K. M. Beaumont, chairman of the committee, pointed out in a short address that the move to Hatfield and the change of proprietorship of the club to the De Havilland Aircraft Company were more innovations which had during the past year proved beneficial to members. In support of this statement Maj. Beaumont announced that the flying hours put in on the club's aeroplanes had increased from 2,200 hours to 3,300 hours; the number of aeroplanes had been increased from five to seven; and the number of licences secured was forty-four "A" and five "B."

Lt. Col. F. C. Shelmerdine, the Director of Civil Aviation, then presented the following cups: Navigation (donor, E. Hicks), A. H. Cook; Map Reading, donor and winner, F. H. Matusch; Aerobatics (donor, P. H. B. Sprosen), E. M. Wright; Forced Landing (donor, M. Young), E. A. Beale; Junior Forced Landing (donor, H. Ross-Kirkman), A. H. Batten.

Flying time last week at Hatfield totalled 30 hr. 35 min., and eight new members have joined.

The R.A.F. Club will be closed from 2.30 p.m. on December 27 until 12.30 p.m. on December 28, but will be open during the Christmas holidays.

Private Flying**HERTS AND ESSEX**

Last week the flying time at the Herts and Essex Aeroplane Club totalled 37 hours, and an "A" licence was obtained by L. Vigil. One new member has joined.

On Boxing Day there will be a Treasure Hunt in the afternoon, followed by a party in the evening.

CAMBRIDGE

Flying times at Marshall's School and the Cambridge Aero Club for the week ended December 14 were: Dual, 22 hr., and solo 12 hr. 30 min. This is in spite of bad weather, which prevailed most of the week, and also of the fact that the University Christmas vacation has started.

The instruction at the school is now in the hands of Flt. Lt. Carr, D.F.C. The school intends shortly to include instrument

flying courses in its curriculum, to enable pupils to comply with the present "B" licence requirements.

Eight members of the Civil Aviation Service Corps attended on Sunday, December 9, and, as flying was impossible, lectures were given on the theory of flight and general airmanship.

RANGOON

Flying at the Rangoon School for the month of October totalled 58 hr. 15 min. The decrease on the previous month's total was due to the loss of one machine, the temporary absence of the instructor, and the MacRobertson Race arrangements. Four new pupils have joined.

During the MacRobertson Race period the aerodrome was closed to visitors, and complete arrangements were made for the reception of competitors and machines.

ENTHUSIASM

In May, 1934, a few members of the disbanded British Flying Corps decided to form a new Corps on a basis of service to the cause of flying. This is known as the Civil Aviation Service Corps.

The first meetings were held on one of the members' private premises, but after about two months headquarters were found and the members, now doubled in number, moved in. After January 1 these will be at 19, Berkeley Street, W.1.

Weekly meetings were held, and flying instruction, which had been arranged with Marshall's Flying School at Cambridge, was, and still is, taken every Sunday.

On August 15 the meeting was attended by Air Com. Chamier, of the Air League of the British Empire, who has used his influence, with the result that the Corps were accorded the patronage of the Air League.

Up to date the Corps have aggregated more than 100 hours flying and about six individual members are nearly ready for their "A" licence tests.

Further arrangements are being made with Marshall's Flying School, Ltd., for a series of lectures to be given when the weather is too bad, and an examination will be held each year.

The Corps is composed of young men of limited means who are very keen to do as much for civil aviation as they can, and

the members pay 1s. each week, or £2 2s. per annum. Each must take half an hour's flying instruction before being admitted. One of the main objects is to give voluntary assistance at flying meetings.

Salvage

An aeroplane in the Thames on a December night presents an unusual but by no means insuperable problem to a well-equipped aircraft salvage unit. Last Tuesday evening, Airwork Service Department received instructions from an insurance company to collect the Herts and Essex D.H. "Moth" from the river near Vauxhall Bridge.

A lorry and trailer left Heston, escorted by a car, and manned by a crew of nine. They found that the aeroplane had been hoisted on to a barge and arrived, in fact, just in time to prevent a crane driver from transferring it to dry land with a mechanical "grip." The crew removed and unboxed the wings, placed a rope round the fuselage and two guy ropes to steady the tail, and gave the word to hoist. With mixed emotions they watched it clear the roof of a 70-foot warehouse and descend slowly in a 20-foot gap between two buildings, steered by the guy ropes. The machine was transferred to the lorry without suffering further damage.

CORRESPONDENCE

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.

LANDING LIGHTS

[2984.]—Your report of Capt. Maund's remarks at the Martlesham dinner brings up a rather interesting point. Commenting on high wing-loading, Capt. Maund remarks that the "Comets" made at least two forced landings during the Australia Race.

Surely the fact that these landings were made in safety points to the sheer value of the "Comets'" landing lights (helped in one case by moonlight), and to the absolute necessity of these aids if night flying is to be anything but a "port-to-port" affair.

Among my own experiences can be included at least two aerodrome landings made in the dusk simply by watching the shape of the landing circle and by the judicious use of engine. If my hired machine had been fitted with powerful landing lights the last half-hour's flying in each case would not have been so fraught with anxiety.

Most of our summer trips are unnecessarily curtailed by the fear that an unexpected head wind will mean a night or "almost night" landing.

AMATEUR.

Manchester.

TOURING COSTS

[2985.]—The enclosed summary of the actual cost of a tour by air may be of general interest.

The route was suggested by the A.A., who also supplied an excellent set of maps. It occupied eight days (August week, 1934). On one day we flew both in the morning and afternoon (from Paris to Marseilles), one day was spent at Nice and no flying was done, on the other days we flew either in the morning or afternoon, spending the remaining time in sightseeing. It was, therefore, quite a leisurely trip from the flying point of view.

The machine and engine required no attention whatever beyond filling up with petrol and oil, and the only mishap

was the loss of one of the sliding windows, which blew out over Marignane aerodrome. The item for "repairs" is the cost of replacing this. Petrol was obtained on a Shell carné, and this method is strongly recommended, the representatives of this company always being most helpful. No difficulties of any kind were experienced with Customs or other formalities at any point.

The ease of communication in a cabin machine meant that only one set of maps was necessary. One member acted as pilot throughout and the other as navigator, and this arrangement was found ideal, as it gave both an interest in the flight. No special clothing was taken, nor was any found necessary, even over the Alps.

MACHINE ... PUSS MOTH. LOAD ... TWO PERSONS WITH AMPLE LUGGAGE.		ROUTE : Heston-Paris-Dijon-Lyons-Marseilles-Nice-Milan-Zurich-Frankfurt-Brussels-Heston.		
DISTANCE FLOWN	1,850 miles.	COST.	£ s. d.	
FLYING TIME	19 hrs. 2 mins.	Hire of Machine	10 0 0	
PETROL USED	123 gallons.	Insurance	8 12 0	
CONSUMPTION	6.46 gallons/hr.	Repairs	1 7 9	
	15.04 miles/gallon.	Hire of Maps (12)	3 2 6	
NORMAL AIR SPEED	100-105 m.p.h.	Petrol and Oil	16 8 0	
MAX. GROUND SPEED	113.6 m.p.h. (Heston-Paris).	Customs, Hangar and Landing Charges	3 4 0	
MIN. GROUND SPEED	80.4 m.p.h. (Brussels-Heston).	Transport to and from Aerodromes	2 15 7	
AVERAGE GROUND SPEED	97.2 m.p.h.	Living Expenses, Hotels, etc.	15 9 0	
		Tips and Miscellaneous	4 5 7	
		TOTAL ...	£71 4 10	

It is hoped that the analysis of costs, which is correct to within a few shillings, may be helpful to those contemplating a similar tour.

The cost of approximately £4 10s. per person per day seems very reasonable when the distance covered and the comfort and interest of the trip are considered.

A. R.

Coventry.

E. P. F.

FLAPS OVER FOREST HILL

Interesting Characteristics of the Piphurst "Pipkin," the First Machine to be Fitted with Split Trailing-edge Flaps on the Upper Surface : An Intrepid Pilot's Seasonable Impressions

FEW of the present generation of pilots will remember a designer of the name of Pipehouse, who caused something of a stir in aeronautical circles by his conversion schemes. Soon after M. Bleriot crossed the English Channel Mr. Pipehouse advertised widely in the Press to the effect that he was prepared—at a slight cost—to convert the existing and markedly unsuccessful biplanes to the more popular monoplane shape.

He had made several successfully fraudulent conversions before a jealous Government, who saw that their particular biplane racket was being more than seriously affected, bought him off with a large estate on Dartmoor.

Now, after a long spell of retirement, Mr. Piphurst, as he is now known, has returned to the aircraft industry and is about to float a sinking fund for the purpose of putting a really up-to-the-minute private-owner type on the market.

If the young men of the present generation of pilots would read their history they would learn not only that world economic events are ruled by the mass movements of the Mongols in their search for grazing grounds, but that no successful flying machine built before the opening year of the present century was fitted with additional aerofoils to spoil the lift of the ordinary supporting surfaces. While Sir Mixam Harim was making experiments with venetian blinds and lawnmowers, and while our own Air Ministry was spending half a million a year of the taxpayers' own money in futile work on split flaps in a small four-hundred-yard wind-tunnel, Mr. Piphurst, or Pipehouse, as he was then, had realised that an aeroplane which merely rose was not enough ; additional spoilers were necessary to bring it down again.

Ingenious Fitments

While resting on his estate he perfected a new system of "inverted" split flap, and last week I had an opportunity of trying out his first hand-made type in the air near Forest Hill, London, S.E. Known as the Piphurst "Pipkin," this machine has split flaps extending over the whole length of the upper trailing edge, and a new system of wireless direction-finding perfected by Mr. Stunk, whose experiments with wireless-controlled full-size aeroplanes at Langley Field (Va.) kept so many people on the move there last summer.

An experienced pilot's most outstanding impression is the ease with which the patent cabin lock can be found to be inoperative when occasion demands. However, while Mr. Piphurst himself was attending to this little difficulty I took the opportunity of making a few practice blind landings with Mr. Stunk in the clubhouse, and emerged feeling quite competent to deal with both the craft and its ingenious fitments.

The "Pipkin" bristles with interesting little ideas, many of which must cause trouble to the airflow and give the machine that very steep approach angle which will make it an ideal type for the novice. These, however, cannot



The "Pipkin" in full flight, with the author of this article at the controls. The flaps are in the position for rapid descent

be described until the type has been put on the secret list passed round by the Moldavian representative at the next session of the United Brass Workers' Convention to be held in Blackpool.

The "inverted" flaps, explained Mr. Piphurst, are locked in the closed position when the throttle is more than half open, and are only to be used for descent. During the take-off, which is made in the ordinary way with the control column held firmly in the left hand, the machine gathers speed.

The whole idea, of course, of the flaps is that the airflow over the upper surface of the wings, of which there are two, are on each side of the fuselage, should be completely broken when a vertical, or nearly vertical, descent is desired, and the ailerons, which are split and on the under side of the surfaces, remain operative by reason of the negative flow creeping around the slightly ingrowing wing tips, which have an adverse camber to give lateral stability at high angles of attack.

Before essaying free flight, Mr. Stunk very kindly explained his direction-finding apparatus. On the dashboard before the pilot's eyes is a dial closely resembling that of the more normal clock face with, however, three hands, each moving at a slightly different speed. When flying along a wireless beam the pilot knows that all is well when—and only when—the three hands are revolving at relative speeds in the ratio of 1—2—3. If the smallest hand slows its tempo, then the machine is to the left of its course; if the largest slows, then it is to the right of its course. The medium-sized hand revolves always at a constant speed, and another instrument, working on the gyroscopic principle, tells the curious pilot his position in relation to the nearest landing ground. There are two types of gyroscope used in flying instruments, free—indicating displacement—and not so free—indicating displacement—and the reader will, of course, understand the principle on which this wireless-controlled instrument is founded.

It is a question now, explained Mr. Stunk, only for our bone-headed, yahoo-chasing Government departments to

equip every aerodrome and field with the right type of transmitter, details of which have not yet been worked out. "It is," he said to me privately after the "Pipkin" had been grounded, "positively pitiful that two great and intelligent Governments, yours and ours, should be so blind to the possibilities of the Stunk Automatic Wireless Pilot Finder."

However, to return to the actual test. During the take-off there are very distinct signs of directional instability with a strong tendency to swing to starboard. After several attempts and some conversation with Mr. Piphurst I eventually discovered that the best method was to face *down wind* before opening up. This swinging characteristic is doubtless explained by the fact that, owing to difficulties with the engine manufacturers, the port and starboard units are of slightly different powers. That on the port side is a 720 h.p. Junkers "Jumo 5," and that on the starboard side is a 65 h.p. Pobjoy "Cascade."

Once safely in the air, I thought of Mr. Piphurst's shouted claim that with larger rudder area and re-rigged wings it would be possible to take off across wind down long, narrow fields—a point which, he claims, is of particular value to the private owner.

Actual flying, with the "Jumo 5" throttled, is extremely easy, though the split ailerons appear to give hardly enough control, and show, at the same time, a marked drag at all speeds. The climb from ground level to 1,000 ft. was stop-watched at 9 min. 15.32 sec. Turns

to the right are easily carried out, but to the left are impossible; Mr. Piphurst is approaching the Parliamentary Air Sub-Committee with the idea of standardising the direction of all landing and other circuits.

Spins to the right are perfectly normal up to fourteen turns—the proximity of the ground interfered with further experiment—but those to the left are too slow to be of any value in providing a method of steep descent.

It was with considerable interest that I moved the flap control after bringing the gliding speed down to 102 m.p.h. Immediately the left could be felt to be leaving as the flow was broken, yet the ingrowing tips allowed the machine to retain its lateral stability as well as some small measure of aileron drag for turning purposes (the flow over the rudder and elevators, of course, had been stemmed).

Mr. Piphurst has fitted a pitot tube in a vertical position, and a second A.S.I. on the dashboard gives the sinking rate. This should be checked as soon as possible.

However, I intended that the smart undercarriage should be given a thorough test with the rest of this interesting machine, and deliberately allowed this vertical velocity to exceed the recommended 93 m.p.h.

After supervising the shovelling-up of the machine into a hand-cart, Mr. Piphurst told me that he proposes to start work on a second "Pipkin" just as soon as he receives the support of his shareholders at the next meeting of the Piphurst Airplane Retrogression Corp., Inc.

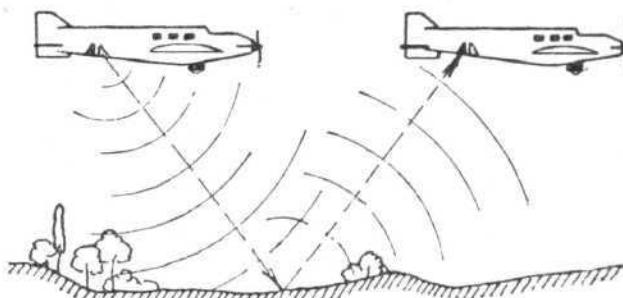
H. A. T.

AN ACOUSTIC ALTIMETER

Interesting French Echo-sounding Device

THE principle of echo sounding is, of course, not new, and attempts have previously been made to adapt the system, which has proved successful for shipping, to the rather more difficult problems of air navigation. Hitherto these efforts have not met with outstanding success, but an instrument designed by French inventors appears to bring the problem one step nearer solution. At any rate, the new instrument has, after exhaustive tests, been approved by the French Air Ministry.

The Dubois-Laboureur aerial sounding device depends, like other echo-timing instruments, upon the principle of emitting a sound and timing the interval between the emission of the sound and the reception of the echo at the point of emission. In this particular instrument the source of the sound emitted is a special siren driven by a small electric motor. The note emitted has a musical frequency of 1,600 cycles, and is of very short duration (thirteen-thousandths of a second). The receiver consists of an electromagnetic microphone very slightly out of phase with the sound signals, and of a sensitive amplifier so designed



The principle of echo sounding

as to exclude the engine and other noises but to amplify the sound of the echo.

Timing is done by a chronoscope which measures with a precision of six ten-thousandths of a second the time elapsed between the emission of the sound signal and the reception of the echo. On the instrument board is mounted a special altimeter having two scales, one indicating heights from 5 to 40 metres (16 to 130ft.), and the

other for greater altitudes, from 30 to 250 metres (100 to 820ft.).

The emitter and receiver, each of which is provided with a horn, are mounted in the fuselage of the aircraft, near the tail. The small diagram shows the basic principle of the system.

There is little doubt that the Dubois-Laboureur echo sounder works satisfactorily over reasonably flat country, but it would appear doubtful whether reliable readings can be obtained in mountainous country where the slopes are steep. The manufacturers, Constructions Electro-Mechaniques d'Asniers, of 236, Avenue d'Argenteuil, Asniers (Seine), France, are ready to give demonstrations.

A Northern Passage

THE Air Ministry's advice (Notice to Airmen No. 114, 1934) to aircraft flying between Scotland and Northern Ireland without radio equipment recalls that the Automobile Association pioneered this route in 1930 for aircraft visiting the Ulster T.T. Race at Belfast.

Describing at that time the special signalling service which the A.A. organised, *Flight* stated that aircraft should make a low circuit over the Coastguard Station at Portpatrick in Scotland and another circuit over the Coastguard Station at Black Head (Co. Antrim). Portpatrick would then notify Aldergrove R.A.F. Aerodrome (for Belfast) by wireless of an

aeroplane's departure, while the Coastguard at Black Head would telephone to Aldergrove news of its safe crossing.

This arrangement involved the provision by the Air Ministry of a special radio installation at Aldergrove, but the experimental signalling service worked most satisfactorily, thanks to close co-operation between the Air Ministry, G.P.O., Board of Trade and the Automobile Association.

The only difference between this and the present scheme lies in the use of Orlock Head Coastguard Station on the Co. Down coast, while there is now direct telephonic communication between the two Coastguard stations.

THE ROYAL AIR FORCE



Service Notes and News

Air Ministry Announcements

"ROTAS" AT OLD SARUM

There are now six "Ratas" on charge of the School of Army Co-operation at Old Sarum, and they will remain there until March, when five will be distributed to the Army Co-operation squadrons, and one (which will be equipped with wireless) will undertake experiments with the School of Artillery. Investigations are being conducted into the flying and maintenance characteristics of the "Rota," and next summer its possibilities for communications and reconnaissance will be explored. Camouflage schemes are being tried out on two of the "Ratas."

CHIEF ENGINEER, R.A.F., INDIA

The War Office announces that Colonel M. A. H. Scott, M.C., has been appointed Chief Engineer, Royal Air Force, India, with effect from July 7, 1935.

ROYAL AIR FORCE GAZETTE

London Gazette, December 11, 1934
General Duties Branch

Lt. H. H. Caddy, R.N., is reattached to the R.A.F. as a Flight Lieutenant with effect from Dec. 1 and with seny. of July 1, 1933. Lt. L. J. S. Ede, R.N., is reattached to the R.A.F. as a Flying Officer with effect from Nov. 5 and with seny. of April 19, 1927. P/O. C. M. Stewart is promoted to the rank of Flying Officer (Nov. 1). F/O. W. H. N. Turner takes rank and precedence as if his appointment as Flying Officer bore date July 25, 1933; reduction takes effect from Sept. 13.

The short service commissions of the following Acting Pilot Officers on probation are terminated on cessation of duty:—R. M. Atkin, E. W. O. Thurston, P. F. Handcock (Dec. 7); I. E. Lloyd-Jones (Dec. 12).

Lt.-Com. A. Brock, R.N., Flight Lieutenant, R.A.F., ceases to be attached to the R.A.F. on return to Naval duty (Dec. 6). Lt. A. G. Poe, R.N., Flying Officer, R.A.F., relinquishes his temporary commission on return to Naval duty (Nov. 15, 1932). (Substituted for notification in the *Gazette* of Nov. 22, 1932.)

Stores Branch

The follg. Flying Officers are promoted to the rank of Flight Lieutenant (Oct. 15):—B. Allen, C. L. Thompson, A. Connock, O. D. Allerton.

Memorandum

The permission granted to C. R. V. Cook to retain the rank of Lieutenant, which was withdrawn on his enlistment into The Rifle Brigade, is restored on his discharge (May 16, 1924).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Wing Commanders.—K. R. Park, M.C., D.F.C., to Special Duty List, 6.12.34; on appointment as Air Attaché, Buenos Aires, vice Grp. Capt. R. B. Maycock, O.B.E. E. D. Johnson, A.F.C., to H.M.S. *Furious*, 9.12.34. For duty as Senior Air Force Officer vice Wing Com. D. Iron, O.B.E.

Squadron Leaders.—E. J. Cuckney, D.S.C., to Home Aircraft Depot, Henlow, 9.12.34. For Engineer duties vice Wing Com. R. J. Mounsey, O.B.E. J. T. Paine, to No. 1 Stores Depot, Kidbrooke, 10.12.34; for Signals duties vice Flt. Lt. T. J. E. Thornton.

Flight Lieutenants.—R. C. Dawkins, to No. 820 (F.S.R.) Squadron, Gosport, 2.12.34. B. M. Cary, to No. 57 (B) Squadron, Upper Heyford, 8.12.34. E. H. M. David, to No. 604 (County of Middlesex) (F) Squadron, Hendon, 6.12.34. W. R. Baird, to No. 230 (F.B.) Squadron, Pembroke Dock, 1.12.34. E. Burton, to R.A.F. Depot, Middle East, Aboukir, 21.11.34. J. A. Easton, to Marine Aircraft Experimental Establishment, Felixstowe, 10.12.34. J. E. MacCallum, to Station Flight, Abingdon, 10.12.34. H. L. Patch, to Air Armament School, Eastchurch, 23.10.34. W. A. Tattersall, to No. 6 (B) Squadron, Ismailia, Egypt, 1.12.34.

Flying Officers.—J. K. Brew, to Headquarters, Air Defence of Great Britain, Uxbridge, 30.11.34. R. W. P. Collings, to Electrical

CRANWELL COLLEGE INSPECTION

Air Chief Marshal Sir Edward Ellington inspected the R.A.F. College, Cranwell, on 14th inst., when Flight Cadets passed out at the end of their course. The following awards were announced:—

Sword of Honour to best all-round Flight Cadet in the Senior Term.—Under-Officer Hubert M. Styles.

Highest Marks in Humanistic Subjects in Senior Term.—Cpl. Evelyn M. T. Howell.

Highest Marks in Aeronautical Engineering in Senior Term.—Cpl. Herbert C. Vickery.

Abdy Gerrard Fellowes Memorial Prize for highest marks in Mathematics and Science.—Acting Sgt. Edmond L. F. Meynell.

J. A. Chance Memorial Prize for highest marks in Service Subjects in Senior Term.—Cpl. Herbert C. Vickery.

R. M. Groves Memorial Prize for best all-round Pilot in Senior Term.—Under-Officer Howard D. Fraser.

PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE

Sister Miss G. F. H. Lloyd is placed on the retired list on account of ill-health (Dec. 11).

ROYAL AIR FORCE RESERVE

Reserve of Air Force Officers

General Duties Branch

The following Flying Officers are transferred from class A to class C:—E. B. W. Bartlett (Aug. 6); S. B. Croyden (Sept. 2); G. P. Longfield (Dec. 5).

F/O. M. T. Bromley relinquishes his commission on completion of service (Oct. 12) (substituted for notification in the *Gazette* of Dec. 4).

The following Flight Lieutenants relinquish their commissions on completion of service and are permitted to retain their rank:—R. L. Stephenson-Peach, M.B.E. (Nov. 1); G. Birkett (Dec. 5).

F/O. W. L. Whitlock relinquishes his commission on completion of service (Sept. 28).

Stores Branch

Flt. Lt. A. J. Nightingale is transferred from class B to class C (Nov. 28).

AUXILIARY AIR FORCE

General Duties Branch

No. 607 (COUNTY OF DURHAM) (BOMBER) SQUADRON.—D. Redington is granted a commission as Pilot Officer (Nov. 19).

ROYAL AIR FORCE INTELLIGENCE

and Wireless School, Cranwell, 4.12.34. P. B. Coote, to No. 15 (B) Squadron, Abingdon, 3.12.34. A. H. Fear, to No. 2 (Army Co-operation) Squadron, Manston, 27.11.34. R. G. Coventry, to No. 500 (County of Kent) (B) Squadron, Manston, 10.12.34. N. P. Samuels, to No. 58 (B) Squadron, Worthy Down, 10.12.34. H. P. Jenkins, to No. 216 (B.T.) Squadron, Heliopolis, Egypt, 20.11.34. R. C. Reynell, to Station Flight, Duxford, 6.12.34.

Pilot Officers.—J. L. Barker, to No. 26 (Army Co-operation) Squadron, Catterick, 26.11.34. H. J. Maguire, to No. 230 (F.B.) Squadron, Pembroke Dock, 1.12.34. S. T. Misselbrook, to No. 204 (F.B.) Squadron, Mount Batten, 1.12.34. D. C. Oliver, to No. 230 (F.B.) Squadron, Pembroke Dock, 1.12.34. J. A. K. Pettit, to No. 230 (F.B.) Squadron, Pembroke Dock, 1.12.34. F. C. Scott, to No. 204 (F.B.) Squadron, Mount Batten, 1.12.34. C. R. Taylor, to No. 201 (F.B.) Squadron, Calshot, 1.12.34.

Medical Branch

Squadron Leader.—H. McW. Daniel, to Royal Air Force Depot, Uxbridge, 10.12.34. For duty as Medical Officer.

Flight Lieutenant.—F. W. P. Dixon, M.B.E., to No. 101 (B) Squadron, Bicester, 1.12.34.

Flying Officers.—J. C. Blair, to No. 2 Flying Training School, Digby, 12.12.34. H. F. Harvey, to No. 3 Flying Training School, Grantham, 12.12.34. G. H. Morley, to No. 5 Flying School, Sealand, 12.12.34.

SPOT-WELDING LIGHT ALLOYS

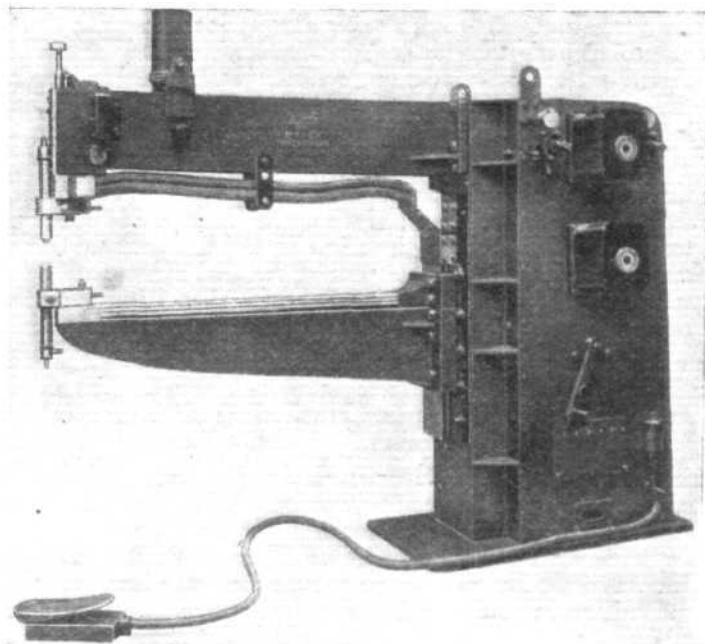
The Sciaky System : Accurate Automatic Control of Operation

HERE are many possible applications of electrical spot welding in aircraft construction. The process has already been used experimentally in the building of flying boat hulls, seaplane floats, strip steel fuselage and main plane members. So far, however, stainless steel has been the principal material used on account of its particular suitability to the method.

The growing popularity of the "metal-clad" wing and *monocoque* fuselage draws attention to the possibilities of using resistance welding in the fabrication of such structures. It is an essential feature of stressed-skin construction that the stresses be low. The use of a high-tensile material is, therefore, only economical if it is kept very thin. Thus one of the light alloys is more suitable than steel for this purpose. It will develop a relatively low stress, but then only a low stress is required. Weight for weight it will be about three times as bulky and therefore have greater stability.

The Sciaky Company claims to have found a method of spot-welding duralumin. The possibilities are immense if their claim is justified. Tests are now being made with a view to getting Air Ministry approval of the process. The finish of a spot-welded duralumin wing or fuselage is very much superior to that of a riveted one, unless countersinking is employed. The weight of all the rivet heads is saved and the work is both quicker and cheaper. If a skilled riveter can put in ten rivets per minute an untrained worker can make thirty to fifty welds. The cost in current is minute, and, of course, no time is spent in drilling or punching holes.

So far the great difficulty with the application of resistance welding to duralumin has been in the preservation of the mechanical properties of the material after the application of the heat. Ordinarily the internal structure of the material breaks down at a temperature of about 515 deg. The Sciaky technicians have found that this difficulty may be overcome if a particular cycle of mechanical pressures between the electrodes is associated with the current cycle. Duralumin, like all the aluminium alloys, has a high conductivity to electricity, and also to heat. It

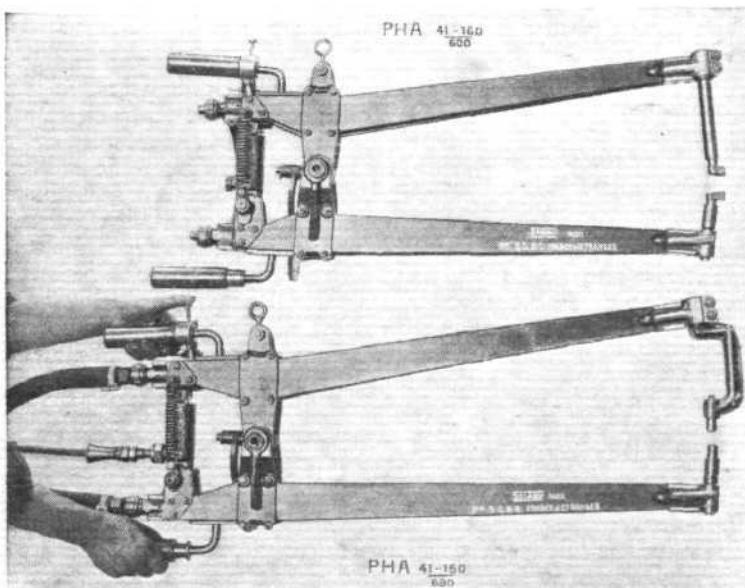


The Sciaky spot-welding machine.

is, therefore, difficult to raise the temperature of the material between the electrode points.

Before the current is turned on, the electrodes bring together the two thicknesses to be welded. This pressure is relieved as the current is switched on, the plates tend to spring apart, and the slight gap between them, minute though it is, creates the necessary resistance. The time of passage of the current is very short and varies between one hundredth and twenty-hundredths of a second, according to the thickness. As the current is cut off automatically, the mechanical pressure is applied again. This is of a high order, perhaps 35 tons per sq. in. The welding machine incorporates a pneumatic relay, for although the electrode points are brought together by the use of the operator's foot control, the actual pressure is subject to the initial adjustment of the machine.

The machine is fitted with an automatic control. This

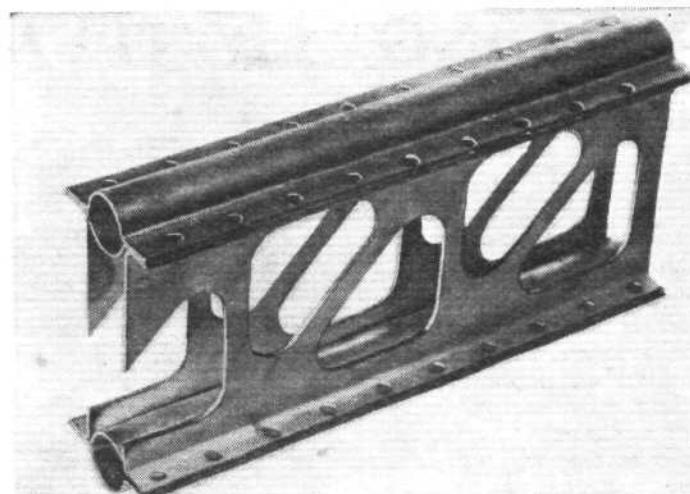


(Left) Pincers for manual application of the Sciaky method on large jobs. (Right) The control unit. If the weld is below normal, a green lamp lights and a bell rings; if the weld is normal, a white lamp lights; an overdone weld lights a red lamp and rings the bell loudly. In the first and last cases, the machine is automatically stopped. Counters record the number of welds in each of the three classes.

is very necessary as the welding times must be strictly identical and the cycle of pressures must follow a definite law if the metal is to regain any of the qualities which it loses in the high re-heating temperature. The controlling apparatus is so designed that it warns the operator by turning on a coloured light and ringing a bell if, for any reason, the weld is not perfect. Further, it can be arranged to stop the machine automatically so that the condition of the electrodes can be checked. This implies deliberate restarting after a faulty weld. Mechanical counters are fitted which add up separately the numbers of weak, good, and burnt welds.

A small difficulty which has previously troubled spot welders is the finding of the exact point at which the weld should occur. The electrodes hide it as they come together, and after they have parted again it may be found the connection has not been made exactly at the desired point. On the Sciaky machine there is a spot light which throws a converging beam on to the exact point at which the weld will occur when the electrodes meet. This is the more important in duralumin welding because the diameters of both electrodes and finished welds are greater than in working stainless steel. This "luminous spot" is a very useful and important addition.

As well as the rather massive fixed welder which is used in the fabrication of "handleable" pieces, there are also pincer appliances which can be used in the assembly of large units such as complete fuselages, hulls, etc. These



A duralumin spar welded by the Sciaky method. The treble thicknesses welded are 0.060in., 0.039in., and 0.039in., totalling 0.138in.

pincers are quite light and can easily be moved around the job by a single operator.

Many tests have been made on the shearing strength of spot welds in duralumin. The following figures are supplied by Sciaky:—

"Each test piece consisted of two thicknesses of normalised duralumin or of vedal 20 mm. wide and 100 mm. long. They were tested in shearing by gripping the two extremities in the jaws of a tension machine so that the welds were in shear. The degree of uniformity was established by repeating each test on fifty identical pieces." Below are the test results obtained by the Sciaky Company.

Test.	Thickness.	Number of Spots.	Shear Strength.	Degree of Uniformity per Cent.
	in.		lb.	
29 DUR	0.012 + 0.012	5	562.3	+ 3.2 and - 3.5
17 DUR	0.023 + 0.023	3	617.4	+ 5.5 .. - 4.5
20 VED	0.031 + 0.031	1	264.6	+ 5.5 .. - 4.5
25 VED	0.031 + 0.031	4	1,102.5	+ 4.1 .. - 3.5
31 VED	0.039 + 0.039	1	220.5	+ 4.5 .. - 4.0

Vedal, incidentally, is similar to Alclad in having a strong aluminium alloy core with surface coatings of pure aluminium.

It might be thought that a process using electrical current in this way exposed the operator to considerable danger. This, however, is not the case. The welding is actually done by a secondary current of very small voltage, the amperage being high. Thus the electrodes, even though naked, can be handled by the operator with safety.

AERODROMES ADVISORY BOARD

Site Selection Committee Established : An Important Announcement

AN announcement issued over the signature of the Secretary, Mr. John Dower, states that the Aerodromes Advisory Board has established a Site Selection Committee through which it offers to advise local authorities and other bodies on the selection of sites to be purchased or reserved for future aerodromes. The Board, which began its work earlier this year under the chairmanship of Capt. the Rt. Hon. F. E. Guest, M.P., has as its members representatives of the principal professional and technical institutions—aeronautical, engineering, architectural, surveying, town planning, etc.—whose co-operation will contribute to the efficient and rapid development of the groundwork of civil aviation.

The lack of any regular or satisfactory system by which municipal or other bodies engaged in or contemplating the provision of aerodromes might obtain advice on their projects, has occupied the earnest attention of the Board. Aerodrome provision falls naturally into two stages—that of site selection and that of the development of selected sites as aerodromes.

For the first (site selection) stage the Board has decided to set up its own organisation, in order that the necessary advice may be available on the broadest possible basis, in consistent and regular form, and at the lowest possible cost. The most difficult questions arising at this first stage are those concerned with the relation of a potential aerodrome site, and of the town it would serve, to a future national airway system whose pattern and organisation are, as yet, undefined. The Board has given close attention to this aspect of the matter, and has formulated and submitted to the Air Ministry proposals for the preparation of a survey and scheme of development for the future air routes and aerodromes of Great Britain.

At the second (aerodrome development) stage it is essential

that the promoting body should obtain the advice of fully qualified professional consultants. The Board has made a careful investigation of the qualifications appropriate to such consultant work, and will shortly issue to local authorities a memorandum incorporating their recommendations in this respect, together with general advice on procedure in the establishment, licensing and development of civil aerodromes.

Local authorities or others who may wish to consult the Board at any stage of aerodrome work, or in particular to obtain the Board's advice on the selection of sites, are invited to apply to the Secretary, Aerodromes Advisory Board, 5, Verulam Buildings, Gray's Inn, London, W.C.1.

The Board wishes to emphasise the vital importance of early purchase or reservation of aerodrome sites. A good site near a town is difficult to find, and is almost invariably subject to the threat of building development; delay may make the cost prohibitive or involve the irrevocable loss of the site. In most cases purchase on an ample scale is strongly recommended, since the land is likely to be a safe and profitable investment, even if it proves to be in excess of the aerodrome requirements.

Death of Mrs. Sigrist

It is with very great regret that we have to announce the sudden death, last Saturday, of Mrs. Doris Seymour Sigrist, wife of Mr. Frederick Sigrist. The funeral took place at Oxshott on Tuesday last. His many friends in the aviation world will join with us in expressing to Mr. Sigrist our very heartfelt sympathy in his bereavement.

COMMERCIAL AVIATION

— AIRLINES ————— AIRPORTS —

SIX-THIRTY EX-PARIS

Imperial Airways are Maintaining their Evening Two-way London-Paris Service Through the Winter : A Passenger's Impressions of a Crossing above the Clouds by Moonlight

"LET me have your passport and take a seat in the waiting-room for a few minutes, sir, please." The scene is Le Bourget.

It is 6.25 p.m., and I am about to travel by the Imperial Airways night machine for Croydon.

Framed by the window, *Heracles* stands out on the tarmac clean and sparkling in the glare of the floodlights. Baggage and mail are being stowed aboard, while a mechanic starts up the little Bristol two-stroke engine which, in its turn, will bring its four big brothers into life.

With sundry coughs and splutters they start milling round while warming up; then there is a short burst of throttle for each—and all is ready for a fairyland trip for the passengers and everyday work for the staff.

Passports are returned, embarkation cards, with seat numbers marked thereon are handed in as we step aboard. A steward wraps a travelling rug around the knees, the door is shut, and the machine gently trundles across the 'drome to get into position for the take-off. A signal light winks to indicate that we may start, and, with engines all out (though in the cabin they sound rather like a subdued waterfall) we rise out of the light of the floodlights into inky blackness.

The apparent darkness is only momentary, for the eyes soon become accustomed to the dull light, and the great planes and struts can be seen against the overcast sky.

Look below. As a child one imagined all the wonders of a model railway wherein everything worked. Here is wonderland—the straight *Routes Nationales*, the twinkling villages, the reflection of furnaces on the steam from trains. Perfection in miniature and everchanging withal.

It is gone, our model, and the windows are obscured with condensation. I try to wipe it away, and begin to hate the saloon lights for their reflection; but it is all to no purpose, for we are climbing through the clouds, and the mist is on the other side of the glass.

Despite the heating arrangements the air grows cold in the cabin, and rugs are tucked in a little more tightly. Gradually the altimeter needle moves through three, four,

and five thousand feet. At six thousand the windows become transparent once more, and a sight surely meant only for the gods comes into view.

The moon, now fairly high in the heavens, sailing almost astern of the machine, casts a wonderful, soft radiance over a scene at once indescribably peaceful, yet awful and terrifying in its vastness. One feels that man has no right here, and that a dreadful price must be paid for his precocity; yet within a few yards the pilots are in conversation with Croydon asking for bearings, weather reports, and other such mundane things. One can have a beer, a sandwich, or a complete dinner in these surroundings. How blasé is the present age!

The altimeter shows a steady seven thousand feet as we gently plough our way along at 100 m.p.h. One's mind becomes accustomed to the new scene, and searches for detail. The sky is pale blue near the cloud horizon, becoming deeper quite gradually as it mounts over us like an inverted bowl. Here, where the air is dry, the stars twinkle with a brilliance never so bright, and the moon encloses the machine's shadow on the clouds with a ring of light.

Here and there a gap in the clouds reveals a few lights on the ground, and one visualises people sitting by their firesides, listening to a wireless programme, maybe, and, hearing the drone of our engines, glancing at the clock to note whether we are on time to-night.

Time passes, and at last the engine noise dies down to a swish as we descend through the clouds to come out over the Brighton Road. Even this is transformed. Each lamp throws a circle of light on the ground, while the lamp itself makes a brilliant dot in the centre of each circle. Farther along, the road becomes a deep orange where the sodium lighting takes the place of the ordinary variety. This is on the border of the aerodrome, and inside can be seen the neon beacon, landing "Tee," and floodlights all ready for our reception.

A gentle turn, a little grumble from *Heracles* as she rolls along the ground, and we are back on earth—back to the daily round, the common task.

J. Y.

BLIND LANDINGS IN AMERICA

The Army Air Corps System, which has been Adopted by the Bureau of Air Commerce

THE Army Air Corps' radio blind landing system has been adopted by the Bureau of Air Commerce, and tentative plans have already been made for the establishment of the equipment along one of the Transcontinental routes.

This system is largely visual as far as the pilot is concerned, and utilises a radio loop compass tuned in to the aerodrome station and on the indications given by two smaller stations placed on lorries driven to special points on the approach line—generally some 1,500 ft. and two miles away from the boundary respectively. One or two trips between these stations will establish the correct course, which is then clocked on the pilot's directional gyro.

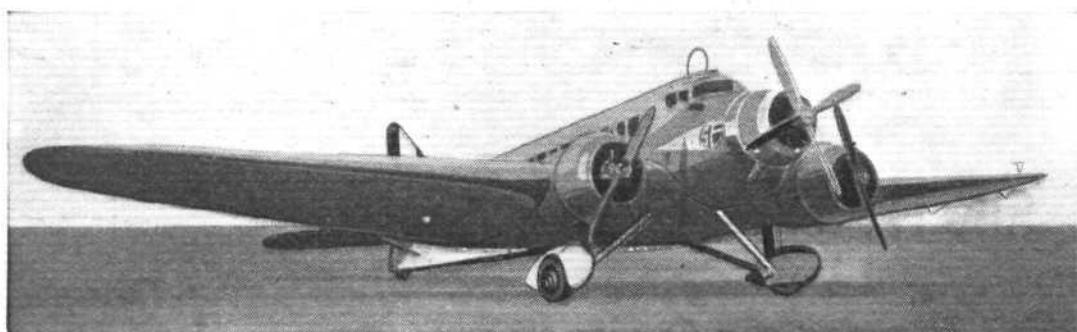
During the final approach a sensitive altimeter is used and

the engines are throttled to such an extent over the outer station, which then acts as a marker beacon giving a dashboard signal, that the inner station will be passed at an altitude of 150 ft. Thereafter the pilot relies on his directional gyro and flies on to the ground. Engine revolutions and speeds during this approach are fixed for certain machines and aerodromes.

The whole is a logical development of the "ZZ" system which is used at certain European aerodromes, and more than 150 unassisted blind landings have been made with a Ford Trimotor by the Army Air Corps during its investigations. Incidentally, the Bureau's instrument flying pilot accomplished his first landing by this system after 1 hr. 15 min. of training in a machine that was unfamiliar to him.

Commercial Aviation

HERE AND THERE



Jersey's Aerodrome

The Jersey States have approved of the plan for an aerodrome at St. Peters.

Hillman Duplication

Two services daily, between London, Liverpool and Glasgow, and between London and Paris, will be operated by Hillman's Airways, Ltd., during the Christmas period.

Linking Sea and Air

It is learnt that an arrangement has been made between Imperial Airways and Cunard-White Star whereby the latter have become general agents of the former. The shipping company's offices and agents in the New World will be at the disposal of prospective air travellers, who will be able to book from New York, say, to Singapore.

For Blind Landings?

An order for six Kollsman precision altimeters for the new Jersey fleet of D.H.86 machines has been received by Brian Lewis and Co. These instruments are often a standard fitting on American aircraft, and were used in the Army Air Corps blind landing tests with a Ford Trimotor.

As soon as two-way radio equipment is installed at Heston it is intended to transmit at regular intervals barometric pressure readings obtained from one of these instruments, as this procedure helps to cancel out some of the few remaining instrumental errors.

A Four-engined "Scion"

A new machine, on the lines of the "Scion," is to be produced next year by Short Bros. This will have four 90 h.p. Pobjoy "Niagara" engines, and will carry ten or twelve passengers at an estimated cruising speed of 120 m.p.h. An initial climb rate of 725 ft. per min., with an all up weight of 5,640lb., is expected, with a maximum speed of 138 m.p.h. and a fuel consumption of 17 gallons an hour.

This design is the result of experience gained by using the "Scion" on the Southend-Rochester service, during the first sixteen weeks of which, incidentally, its fuel consumption worked out at 10.3 ground miles per gallon. All-in running costs have proved to be as low as 10d. a mile, including all possible charges on the service. The "Scion's" single-engined performance has, however, been a little disappointing, and the new development should be even more useful from the point of view of the unsubsidised operator.

Spartan's Christmas Time-table

The following services will be run on December 21, 22, 24 and 26 by Spartan Air Lines, Ltd.:

UP.		Cowes		DOWN.
11.00 ..	2.00			1.00 .. 4.00
11.10 ..	2.10	Bembridge	↑	12.50 .. 3.50
11.55 ..	2.55	Croydon	↑	12.05 .. 3.5

No services will be run on either Christmas or New Year's Day.

The normal once-daily winter service runs as follows:

UP.		Cowes		DOWN.
11.00	↓			1.00
11.10	↓	Bembridge	↑	12.50
11.55	↓	Croydon	↑	12.5

A car leaves Victoria Station at 12.45 p.m.

ITALIAN EQUIPMENT FOR S.A.B.E.N.A. Three Savoia Marchetti S.73 eighteen-passenger monoplanes of the type shown here, fitted with 600 h.p. Gnome Rhone K.g engines, will soon augment S.A.B.E.N.A.'s fleet. The machines' cruising speed is 167 m.p.h. and the maximum speed 202 m.p.h.

Across Italy

Although it is pleasant to know that an agreement, which was originally reached last year, has been signed, giving Imperial Airways the right to fly over Italy in return for certain concessions, no change in the Empire route is likely until an agreement has been reached with France.

The French Air Ministry has announced that British air services to India and the Cape will be permitted to cross French territory. The agreement, however, only enables machines to cross and not to use Marseilles, for instance, as a port of call. Meanwhile, negotiations continue.

Telegrams for Imperial Passengers

The Postmaster-General announces that arrangements have been made with Imperial Airways, Ltd., by which telegrams can be accepted at certain Post Offices for transmission to persons travelling in Imperial Airways machines whilst in the air over sections of the Empire routes between Alexandria and Karachi and between Alexandria and Cape Town.

The service will be on an experimental basis, and the acceptance of telegrams will be confined to the Chief Office, the Central Telegraph Office and the Leicester Square Office in London, and to the Head Offices in Birmingham, Bradford, Dundee, Edinburgh, Glasgow, Leeds, Leith, Liverpool, Manchester, and Southampton. Full information can be obtained at these Post Offices. The service started on December 10.

"B" Licensed Pilots and "Blind" Flying

An Air Ministry notice to airmen (No. 109, 1934) states that from April 1, 1935, all renewals of "B" pilots' licences (Public Transport and Aerial Work) will be subject to the production of satisfactory evidence that the applicant has (a) already passed the "blind" flying test at the Royal Air Force Station, Hendon; or (b) has during his service in the Royal Air Force passed satisfactorily a course in instrument flying at the Central Flying School or other instructional unit; or (c) has carried out "blind" or cloud flying in Royal Air Force Squadrons during Squadron training; or (d) has undergone an instrument flying course at an approved civil training school or establishment.

Those who cannot produce such evidence will be required to pass the practical flying test in "blind" flying as specified in paragraph 99 (1) (g) of the Air Navigation Directions, 1932 (A.N.D. 11).

Speed—at a Price

The Fokker Company has estimated the performance of the Douglas DC.2 monoplane when fitted with two Gnome-Rhone "Mistral Major 14 Krsf" engines of 900 h.p. each. Normally the Wright "Cyclone" or Pratt and Whitney "Hornet" of 700 h.p. is installed. With the big French two-row radials it is computed that the maximum speed will be 240 m.p.h. and the cruising speed, at 62½ per cent. maximum power, 196 m.p.h. Flying on only one engine the ceiling should be 13,780ft., and with both engines in operation 26,250ft. With full tanks and cruising at 196 m.p.h. the range is expected to be 1,056 miles. The payload is not given.

Performance figures have also been estimated for the Fokker F.XXXVI with four "Mistral Major Krsd" engines of 815 h.p. The top speed is 202 m.p.h. and the cruising speed, at 62½ per cent. maximum power, 165 m.p.h. Both climb and ceiling are greatly improved, but the range and payload are reduced by 62 miles and 1,210 lb. respectively.

CROYDON

The Imperial-Cunard Arrangement : Taking Examiner to Pupil : The First "Dragon Rapide" for Charter : The West of England Service : A Record Australian Mail

THE first passenger to benefit by the new agreement between Imperial Airways and the Cunard line was met at Cherbourg by Capt. Wilcockson with the Westland "Wessex" as he stepped off the *Berengaria* on Friday, December 14.

He was flown to Croydon in 70 minutes and arrived in England at 9.45 a.m. The other passengers from the same boat reached this country at 5.30 p.m. In consequence, this passenger was able to complete a day's business in London and leave for Copenhagen by the K.L.M. morning service.

The recently constituted Medical Council of India suggested that examiners might visit India by air to conduct the first examination for the Fellowship of the Royal College there rather than in England, as has been done in the past. The Council of the College accepted the invitation, and last Wednesday Prof. W. Wright, D.Sc., F.R.C.S., of the London Hospital and Medical School, and Prof. John Melanby, M.D., F.R.S., of St. Thomas's Hospital Medical School, left Croydon by K.L.M. to catch the Tuesday morning Amsterdam-Batavia machine, their destination being Madras. With them went Mr. H. H. Rew, Director of Examinations of the Royal College.

Holding this examination in India confers a great saving of time and money on medical graduates of India, who will now need only to pass the final F.R.C.S. examination on reaching this country, thus necessitating a much shorter stay.

The example set by the examiners in flying out might be followed by examinees when coming here for their final, when the time expended on the whole visit would be still further shortened. The examiners will return to England by Imperial Airways, Ltd., on Monday, January 14.

Olley Air Service, Ltd., announce that the first D.H. "Dragon Rapide" (D.H.89), to be used in charter work, should be delivered to them during December, and a second machine of the same type a few weeks later. The D.H.89 cruises at 140 m.p.h., so it should prove really useful.

Provincial Airways, Ltd., show considerable activity on their

West of England route. One of their clients is a frail old lady of close on ninety, whose car has to be brought up to the cabin door of the aeroplane. She loves flying for its own sake and because it is the least tiring form of travel, making frequent trips between London and Bournemouth, London and Plymouth, and so on. There was also a party of jovial Cornish farmers who flew up from the West for the Smithfield Fat Stock Show, and the Mayor of Penzance made a flight to London during the week.

Recently Surrey Flying Services, Ltd., have extensively reorganised, and can now undertake full overhauls on their Croydon premises.

The first experimental loud speakers are now in operation in the Main Hall. At present there seems to be far too much reverberation, and most announcements resemble gorilla roars in a forest.

A journalist in a daily paper asks, "Why don't you fly?" and discusses various reasons, some of them fantastic, why many ordinary people do not fly. The main reason seems to have escaped him. People who are now over forty years of age were not taken into aeroplanes by their parents when very young, and these people, in the mass, dislike anything new and unfamiliar. They are afraid of the unknown—not of flying—and they cheerfully take the familiar surface journeys by sea through fog, or along the roads with incompetent drivers. Nobody ever heard of a schoolboy or a schoolgirl being afraid to enter an aeroplane.

Capt. A. B. H. Youell, one of Imperial Airways' youngest commanders, completed his millionth flying mile last Thursday. This achievement coincides with the gaining of his Master Pilots' Certificate, and "Jimmy" Youell is the only pilot in the world to have these two distinctions.

On Saturday a record mail, weighing, it is believed, more than 2½ tons, left Croydon by Imperial Airways Australian route. Services have had to be duplicated all the way to Singapore.

A. VIATOR.

NEW EQUIPMENT IN SOUTH AFRICA

South African Airways, which are now run by the Government of the Union as a wing of the Railway and Harbours Administration, recently acquired three new 17-seater Ju 52 Junkers monoplanes, and these machines arrived at their base in Durban last month. They are to be used on the main mail routes between Durban and Johannesburg and Durban and Cape Town. The first service to the Rand was inaugurated on November 13.

The three new machines arrived at Germiston Airport on November 5, several days ahead of their schedule, the flight from Dessau having been accomplished in exactly a week.

Each has three 600 h.p. Pratt and Whitney "Hornets," any two of which will carry the maximum load. They have a cruising speed of 150 m.p.h. and a range of 750 miles. It is interesting to note that each machine is equipped with an automatic pilot and directional gyro. The flight was led by Capt. Fry, of the South African Airways, German pilots flying the other two machines.

On their first scheduled flight to Durban they carried thirty-five passengers and broke the commercial record by thirty-five minutes, taking less than two hours on the trip. A daily

service between Durban and Johannesburg has been reintroduced.

The higher speed of the new machines puts Cape Town within six hours of Durban, and it is the Government's intention to make the trip in one day instead of spreading it over two, as was the case with the smaller six-seater Junkers. The Cape service is also to be doubled. The other Junkers will probably be used on new services from Port Elizabeth to Bloemfontein, and from Johannesburg to Delagoa Bay, stopping at the Kruger National Park.

All pilots in the South African Airways are to be trained to fly the new types, and additional pilots and engineers have been engaged. The eleven new directional wireless stations approved by the Government will be in operation early in the new year.

Incidentally, the three new machines are fitted with Marconi transmitting and receiving equipment to link up with that used on the present London-Cape Town air route. They carry, also, Marconi directional equipment, and the company provided an engineer and two expert operators to accompany the Junkers aircraft on their delivery flight.



ON DURBAN AERODROME : Five of the South African Airways' fleet, including the three new Ju 52's which were recently flown out from Dessau.

NEW BOOKS

C. W. A. Scott's Story

* *Scott's Book: The Life and Mildenhall-Melbourne Flight of C. W. A. Scott. Told by Himself.*

Things move quickly when Mr. Scott is on the job, and this book about his life, which includes a cabled account of his win in the MacRobertson race, appeared in record time. His publishers explain how the seeming miracle was worked.

Naturally enough, the reader hopes that the *pièce de résistance* of the book will be the chapter about the Mildenhall-Melbourne race, and, equally naturally, he is disappointed. Cables hardly allow expansiveness. But if the reader has been conscientious (as this reviewer invariably is!) and has read straight through the book from the beginning, he will already have followed Scott on three other record flights between Australia and England, and will almost rejoice that the fourth account is not too verbose. It is a very plucky thing for a man to go struggling on when he is half dead from want of sleep; but one cannot keep up one's interest if one reads too much of that sort of thing.

Apart from the records, there is a good deal of interest in the story of Scott's life. He gives a very good account of his time in the R.A.F. as a short-service officer, and another very interesting account of flying on route and on special charter for Qantas. The story of his crash from a spin in a cloud is very well told, and he is very modest about the gallantry with which he dashed into the flames to rescue his mechanic. That, of course, was the finest thing he ever did.

Scott has made his name because, as he admits, regular work has always bored him. That kind of character makes flying history, but the trouble may come when there are no more records left for him to break. Perhaps a rocket journey to the moon will take his fancy.

F. A. DE V.R.

(* Hodder and Stoughton, 7s. 6d. net.)

G.A.P.A.N. Annual Meeting

THE annual meeting of the Guild of Air Pilots and Air Navigators of the British Empire was held recently at the Royal Aeronautical Society, and forty members were present to hear the Master's report. Printed copies of the report were circulated to the 186 members and 141 associates of the Guild.

In his report, the Master, Captain the Rt. Hon. F. E. Guest, P.C., C.B.E., D.S.O., referred to the steady progress that had been made during the year. Among the matters dealt with by the Guild, he said, had been the marking on aeronautical maps of wireless masts over sixty feet in height; the appointment of two representatives to the Aerodromes Advisory Board; and a recommendation to the Air Ministry regarding the second-class air navigators' examinations, as a result of which the results of the examination just held would be announced in six weeks instead of being delayed for a much longer period.

The Guild, continued Capt. Guest, had had under consideration the question of a standard uniform for pilots; when the time was ripe this matter would be carried further. Other points were that the Guild had prepared and printed a standard form of contract for air pilots, with clauses designed to represent a fair engagement as between employer and pilot; that it was accepting, as probationary associates for a year, officers leaving the R.A.F., to assist them to enter civil aviation; that the number of Instructors' Certificates issued by the Guild was now 253; and that winter classes for instruction in the syllabus necessary for the second-class air navigators' examination were now being carried out simultaneously in London and Liverpool, while arrangements had been made for special wireless classes as well.

The adoption of the report was moved by Mr. G. M. Cox, M.C., and seconded by the Most Hon. the Marquis of Douglas and Clydesdale, M.P., who in a short speech outlined a number of ways in which the Guild might augment its sphere of usefulness. A vote of thanks to the Master and to the retiring Deputy Master, Mr. O. P. Jones, was proposed by Captain Norman Macmillan.

Air Navigators' Examination—Successful Candidates

The Air Ministry announces that the following candidates have passed the examination for Second Class Civil Air Navigators' licences held during the week commencing October 15, 1934:

London Centre.—Ashton, R., Bliss, R. E. P., Bredenham,

A Pilot's Reminiscences

* *Wings. By H. C. Biard*

Flying meetings have been less genial affairs since H. C. Biard ceased to be test pilot to the Supermarine firm. When Biard felt inclined to make himself amusing no one could keep the company in better humour, and few men were more generally popular. He was withal a great pilot, a winner of the Schneider Trophy, and twice the holder of the world's air speed record. It is right that such a man should publish the story of his career. He has earned the right to blossom forth into print. In this record of his twenty-five years of flying it is chiefly his capacity for telling a good story which comes to the top. The book is less an autobiography than a collection of really good yarns, mostly very well told.

Apart from the humour of the book there are some very fine passages of descriptive writing. Best of them is the account of the Schneider race at Naples in 1922, when Biard, in the "Sea Lion," brought the trophy back to Great Britain. Another good piece of writing tells of his crash in the Supermarine S.4 monoplane at Baltimore in the Schneider contest of 1925. We were then learning about wing flutter, and Biard was unfortunate to suffer from the lack of full knowledge at that time. That 1925 affair was the last time that British firms put in private entries for the Schneider contest. After that year the R.A.F. took up the task of challenging, and Webster, Wagstaff, and Boothman made it certain that the Trophy should finally remain in this country. Still, one cannot help sympathising with Biard in that he was not allowed to fly the S.5.

We are glad to hear of Biard again through this book. We assure him that he is not forgotten, and we trust that the sales of his book will provide a substantial contribution to his domestic budget.

F. A. DE V. R.

(* Hurst and Blackett, Ltd., 9s. 6d. net.)

V. J. W., Burt, E. J. E., Capper, N. J., Cass, K. N., Finnegan, E. J., Hill, E., Messenger, L. V., Wood, G., Woodhouse, H. O. *Heliopolis*.—Mathieson, J. M., Paterson, A. *Singapore*.—Collins, H. B., Gaine, M. L. *Hinaidi*.—Dobson, J. A., Noyes, L. B.

Twenty-four candidates sat for the examination in London, three at Heliopolis, two at Singapore, and three at Hinaidi. The next examination will be held during the week commencing March 18, 1934.

"Some" Diesel!

Readers will probably have guessed that the power of the Deschamps diesel engine mentioned in the report of Capt. Forsyth's recent lecture is not as high at 12,000 b.h.p., which was the figure inadvertently given. The designers will, we imagine, be quite pleased if they get 1,200 b.h.p. out of the engine.



NEW COMPANIES

COMETAL LTD. Capital £100 in 1/- shares. Objects: To carry on the business of manufacturers of and dealers in iron and steel, alloys, precious metals, metallic ore and sheet metal, motor car and aeroplane components, etc. The first directors are: Hubert D. Cooper, Park House, Church Street, Stoke Newington. Frederick W. W. Wootton, Newfield, 103, Green Lane, Northwood, Middlesex.



PUBLICATIONS RECEIVED

Seaplane Design: By William Nelson. Price 21/- net. London: McGraw-Hill Publishing Co.

Air Publication 1465. Volume 1. The Seal Aeroplane Panther IIA, Aero-Engine. Price 3/6d. net. London: H.M. Stationery Office, W.C.2.



AERONAUTICAL PATENT SPECIFICATIONS

APPLIED FOR IN 1933

Published, December 20th, 1934.

- 21691. BLACKBURN AEROPLANE & MOTOR CO. LTD., and PETTY, G. E. Apparatus for suspending torpedoes and the like from aircraft. (419,895)
- 24063. BRISTOL AEROPLANE CO., LTD., and BARNWELL, F. S. Engine mountings for aircraft. (420,025)
- 29737. FAIRY AVIATION CO., LTD., and ORDIDGE, F. H. Undercarriage of aircraft. (420,120)

APPLIED FOR IN 1934.

- 5738. WALTER MOTOR CARS & AERO ENGINES, LTD. Charge-forming devices for aircraft internal-combustion engines. (420,034)
- 21927. IRVING AIR CHUTE OF GREAT BRITAIN LTD. (Lundholme, C. H.) Parachute equipment. (420,059)